

# Workforce and economic surprises in the post-covid 2020s

*Slides prepared for the*

Hawaii Workforce Development Council Meeting

June 28, 2022

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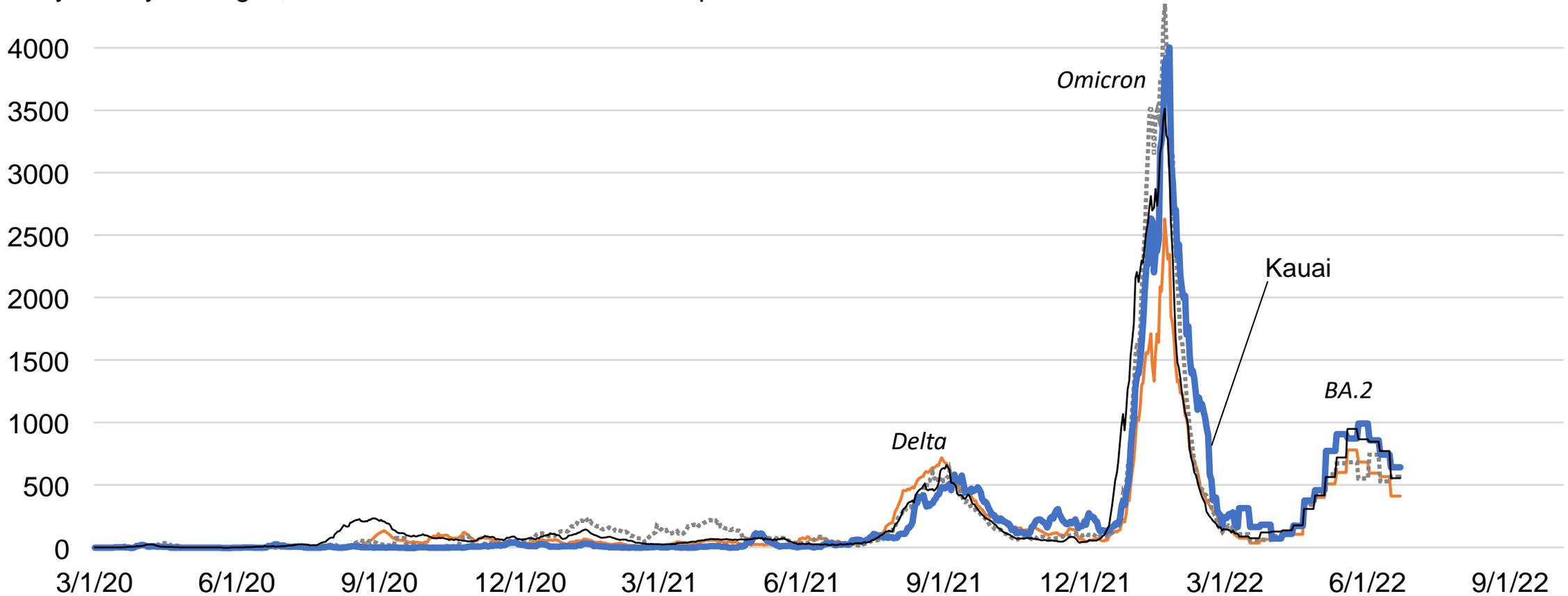


# Hawaii has highest normalized daily COVID-19 case counts in U.S.

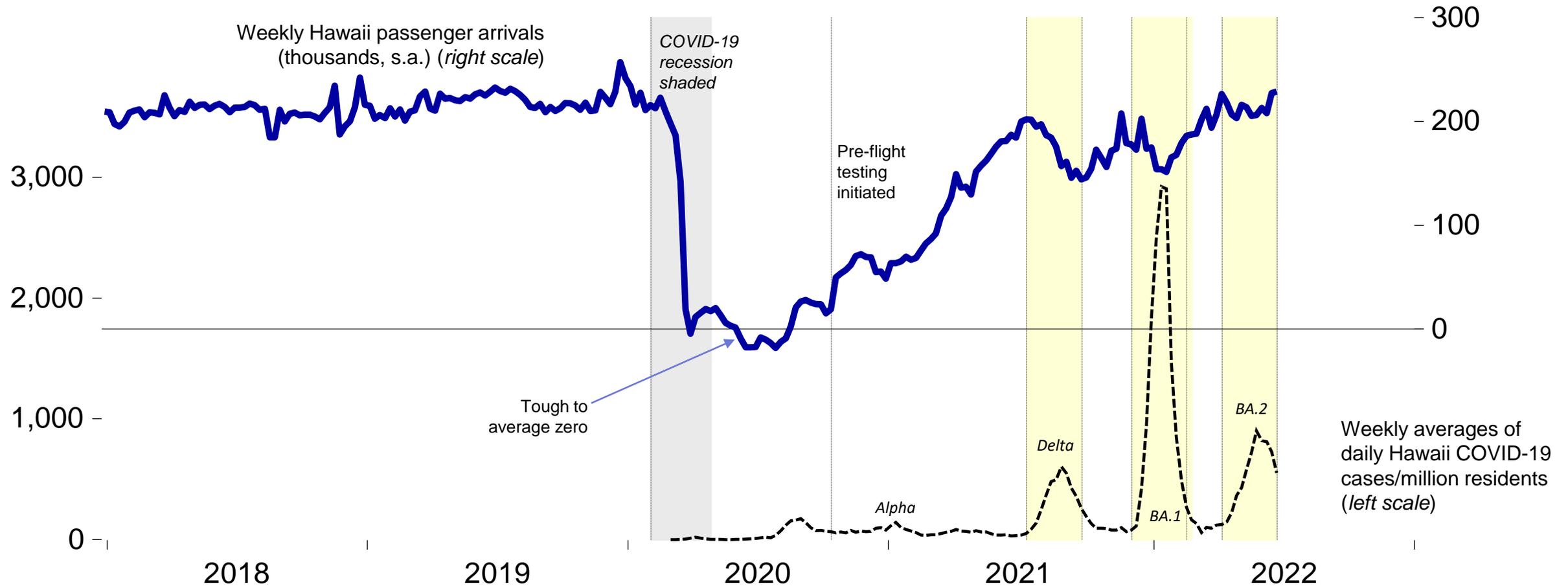
- COVID-19 variant waves (Delta, Omicron, BA.2): less lethal, more infectious
  - 9/11-magnitude decreases in travel volumes, each wave (minus 15-20 percent)
  - Ongoing suppression of resident economic activity in high-frequency data
  - Unambiguous negative impacts on job openings
- Economic activity still being tamped down by recurrent waves (ignore denialism)
- Rough ride for economic recovery, now at risk of slowdown to stifle inflation

# Kauai still the worst, currently with a 23% test positivity rate (zounds)

Daily county averages, new confirmed COVID-19 cases per million residents

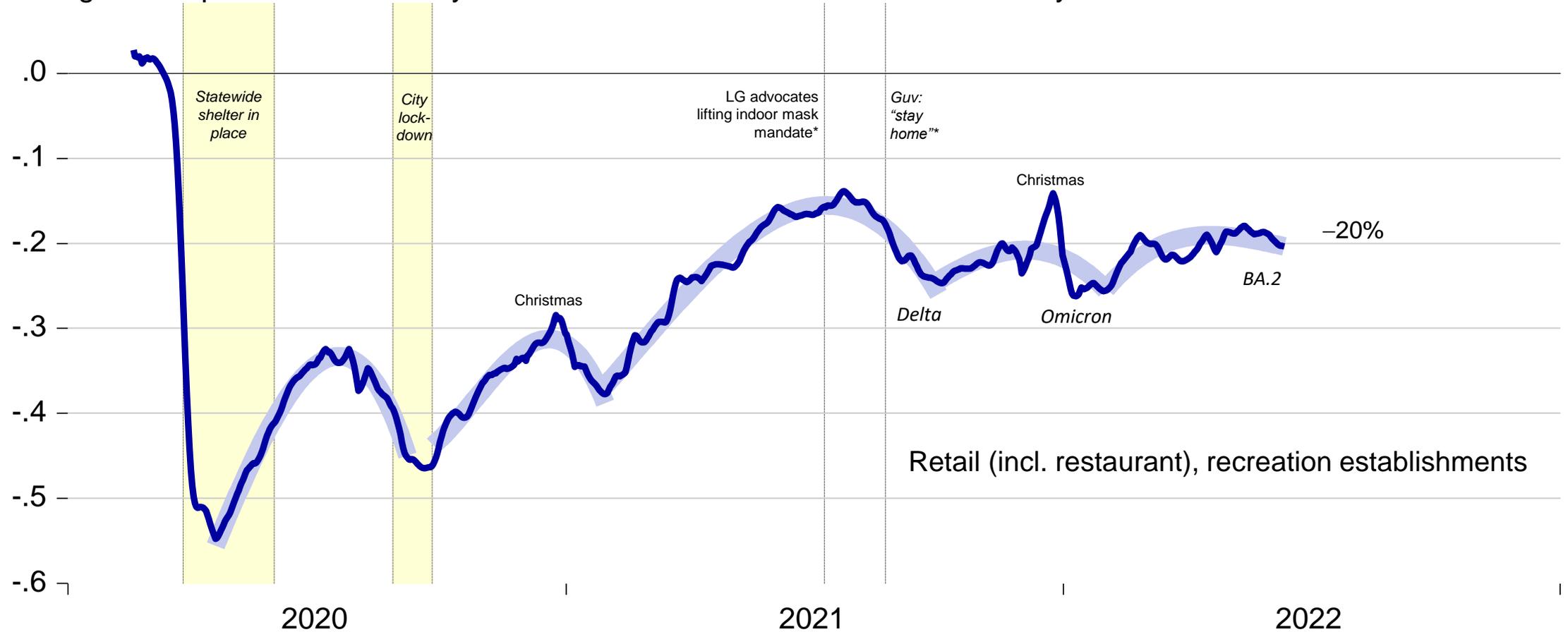


# Travel demand contracted after each Hawaii's COVID-19 waves—Delta, Omicron (BA.1, BA.2)—through June 2022; weekly data



# Behavioral changes in anonymized daily Hawaii resident mobility data on retail, food service, recreation activity: people act *before* “leaders”

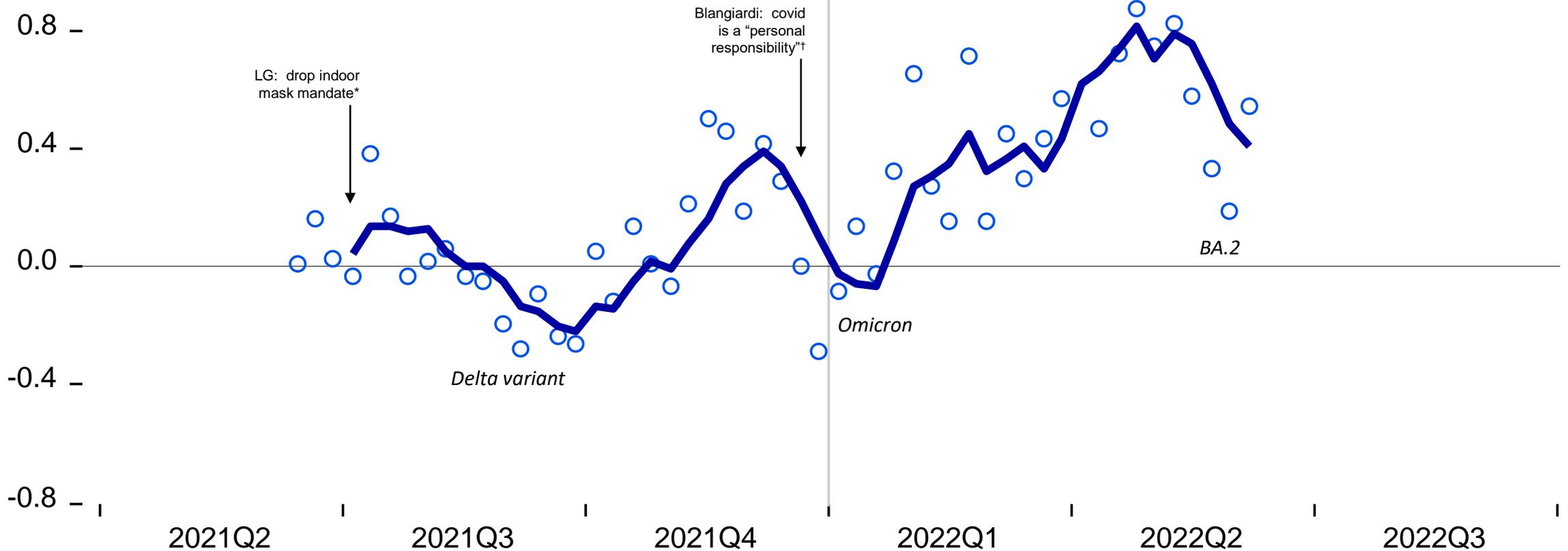
Google smartphone GPS mobility index for Hawaii residents relative to January 2020



\*Mahealani Richardson (July 9, 2021) “Ige wants to keep the mask mandate. Green says it’s time to drop it,” *Hawaii News Now* (<https://www.hawaiinewsnow.com/2021/07/10/state-leaders-debate-over-lifting-indoor-mask-mandate/>), Associated Press (August 23, 2021) “Hawaii’s Governor Asks Tourists to Stay Away Because of COVID,” *National Public Radio* (<https://www.npr.org/2021/08/23/1030532161/hawaii-governor-tourists-stay-away-covid>)

# Each COVID-19 variant wave since June 2021 coincided with suppressed Hawaii job postings, throttling an upward trend

Index of average Hawaii job postings relative to January 4-31, 2020



\*See previous slide †Lia Kamana (December 23, 2021) "Mayor Blangiardi emphasizes personal decision-making and personal responsibility at this stage in the fight against COVID-19,"

([https://www.kitv.com/video/mayor-blangiardi-emphasizes-personal-decision-making-and-personal-responsibility-at-this-stage-in-the-fight/video\\_2bebac07-357f-5dbd-87a9-c56f7800fcb0.html](https://www.kitv.com/video/mayor-blangiardi-emphasizes-personal-decision-making-and-personal-responsibility-at-this-stage-in-the-fight/video_2bebac07-357f-5dbd-87a9-c56f7800fcb0.html))

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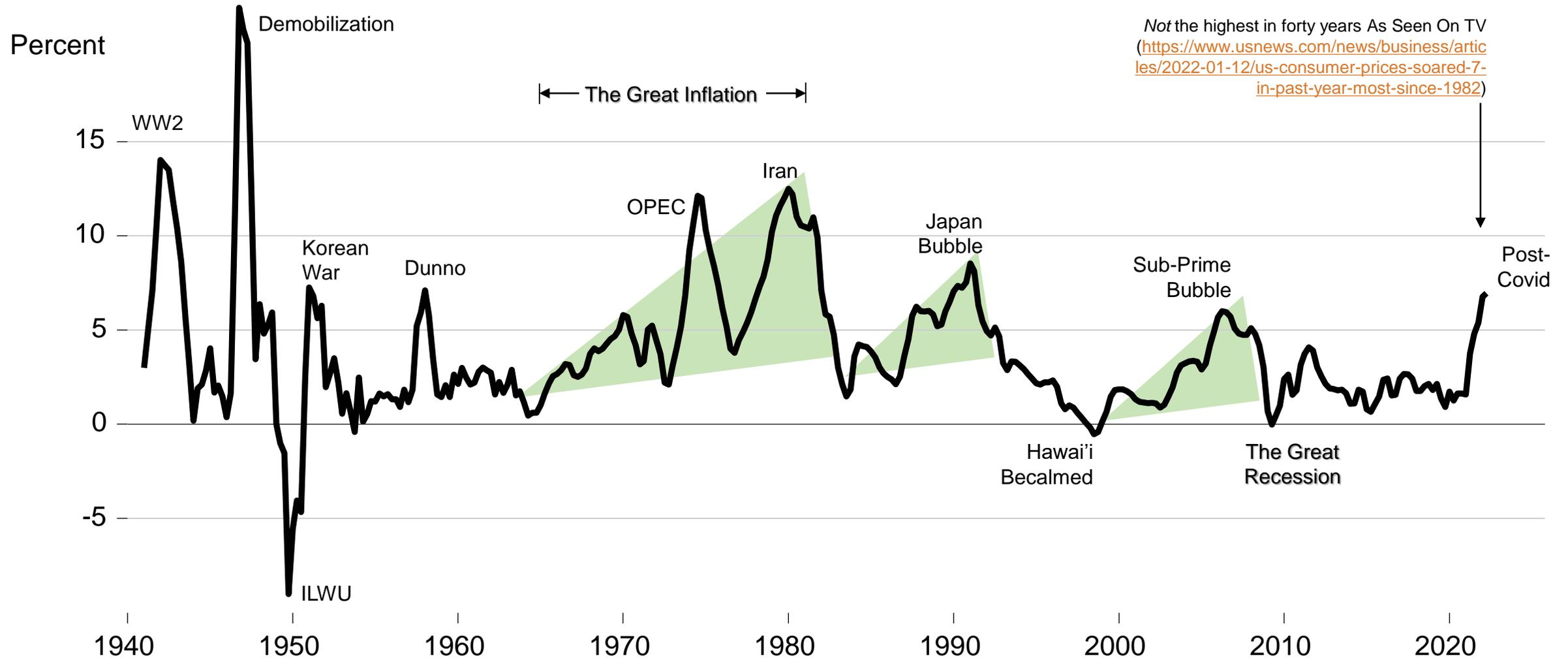
Sources: Opportunity Insights Economic Tracker (<https://tracktherecovery.org/>) weekly average level of Hawaii statewide job postings relative to January 4-31, 2020 through June 10, 2022 from Burning Glass (<https://www.burning-glass.com/>, <https://raw.githubusercontent.com/OpportunityInsights/EconomicTracker/main/data/Burning%20Glass%20-%20State%20-%20Weekly.csv>).



## Inflation: “This Not The Mainland” (bumper sticker)

- Consumption surge initiated recovery, but goods consumption now braking hard
- Services consumption never did catch up; tourism still at 0.8-0.9 of potential
- Urban Hawaii inflation (7.0% May 2022) not the highest in forty years!
- Hawaii inflation also not cumulation of 5-15 year build-up: try 1-year kick-flip (This Not The '70s)
- Hawaii inflation a mix of global supply chain disruption (about 3 percentage points) and “macro” factors on the aggregate demand side of economy (about 4 percentage points)
- Goods inflation predictable: petroleum (Putin); used vehicles (semiconductor spillover); food (supply chain)—Federal Reserve policy can't fix Russian invasion of Ukraine
- Gave up on the Phillips Curve did you? What inflation did you expect at 4% unemployment
- Outlook—take a chill pill, wait 18 months for inflation to subside

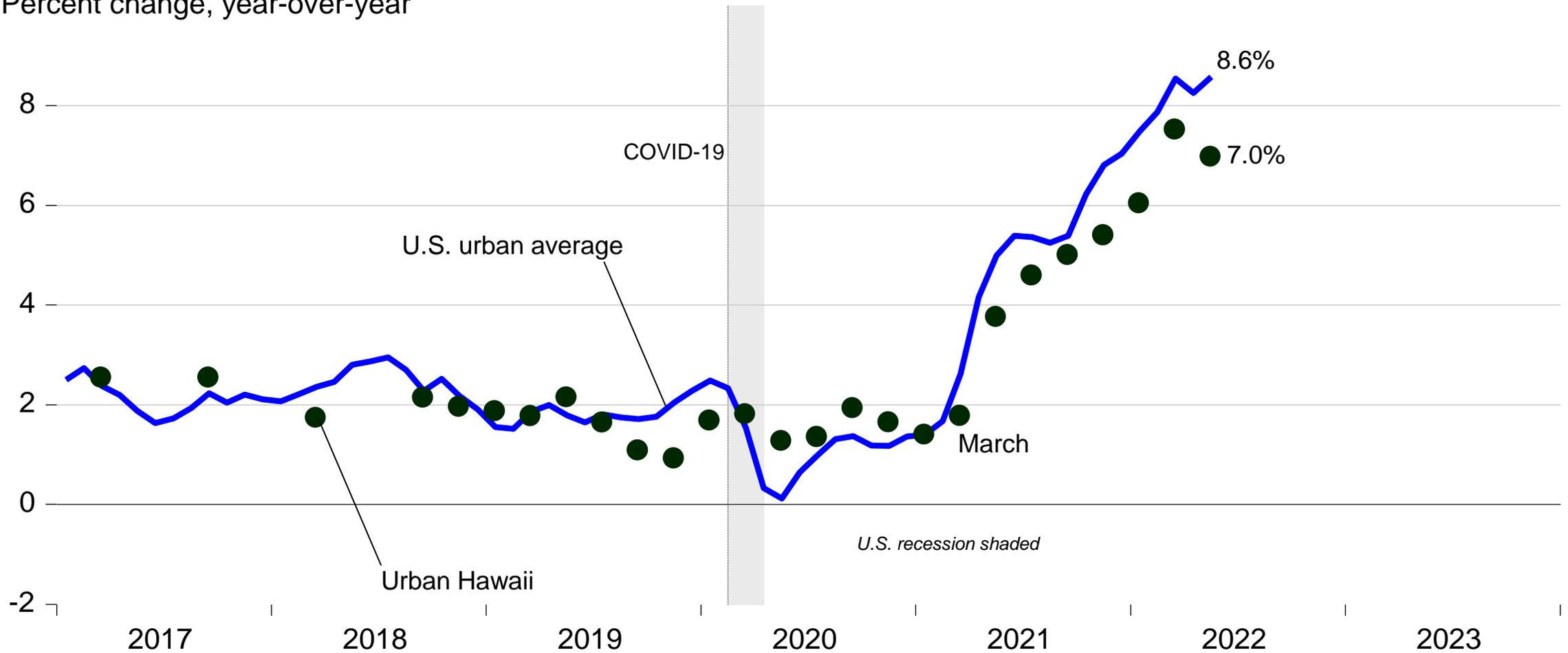
# Quarterly Urban Hawaii consumer price inflation at mid-2022 *not* the highest in 40 years; not drawn out as in past macroeconomic surges



Not the highest in forty years As Seen On TV  
<https://www.usnews.com/news/business/articles/2022-01-12/us-consumer-prices-soared-7-in-past-year-most-since-1982>

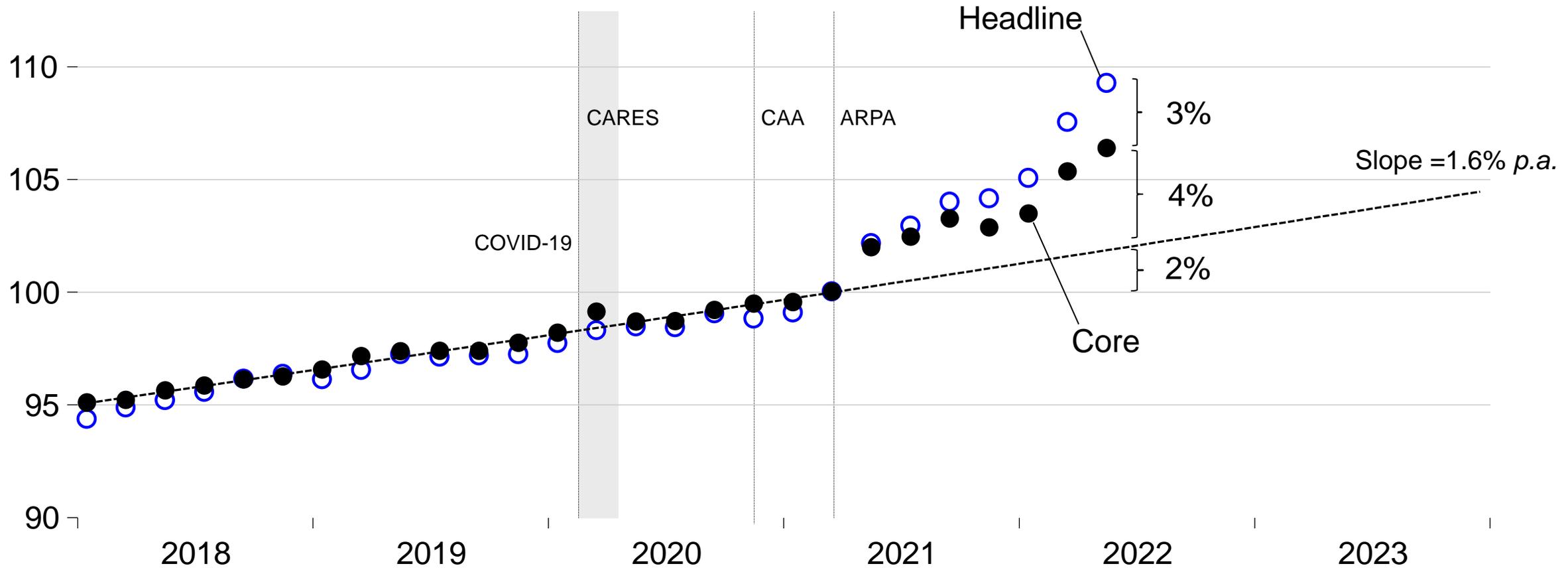
# Inflation rising from mix of 2021 supply chain constraints, pandemic disruptions, input price shocks (oil, labor), demand (fiscal stimulus)

Percent change, year-over-year

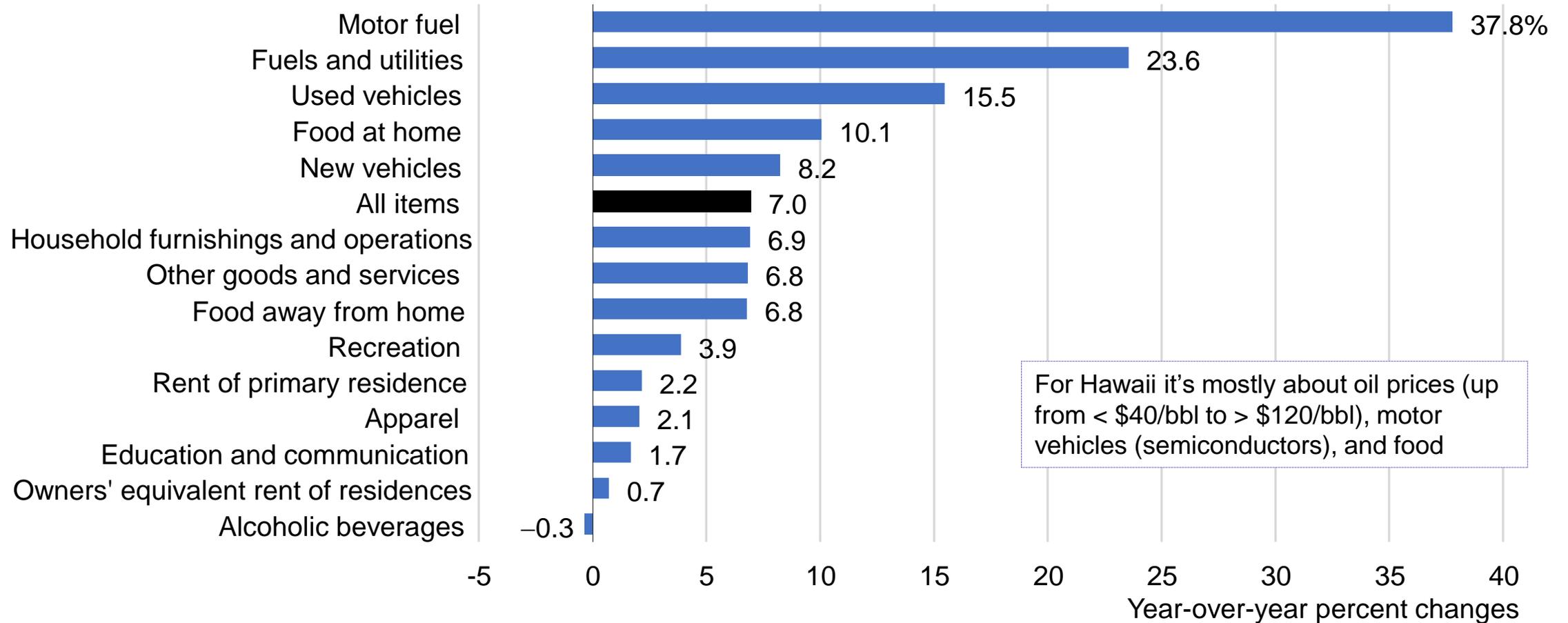


# Do the math: segregate (1) headline inflation (micro (AS)); (2) Urban Hawaii core inflation (macro (AD)); (3) pre-covid trend. $\Sigma = 7\%$ actual

Urban Hawaii consumer price indexes, March 2021 = 100 (log scale)

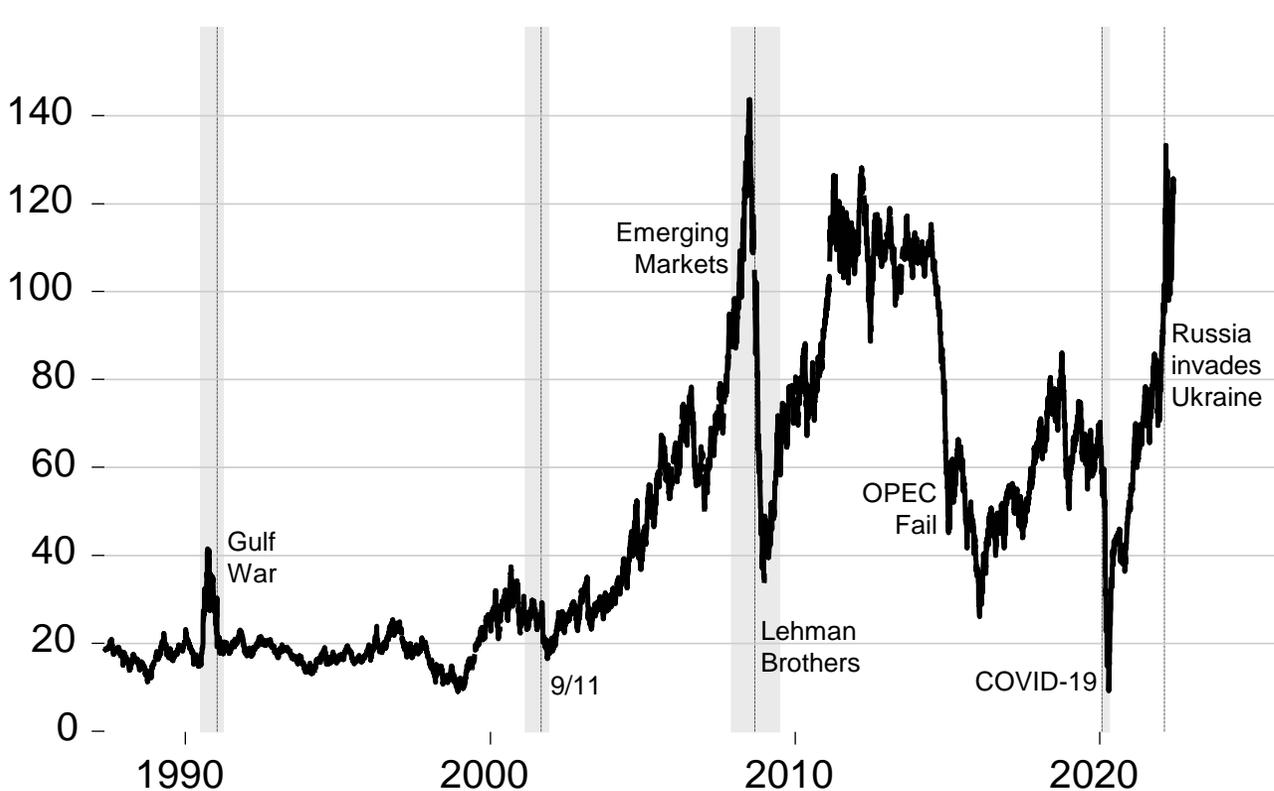


# Component rates of Urban Hawaii inflation May 2022 led by energy and food—classic supply shocks—but core inflation rate also high



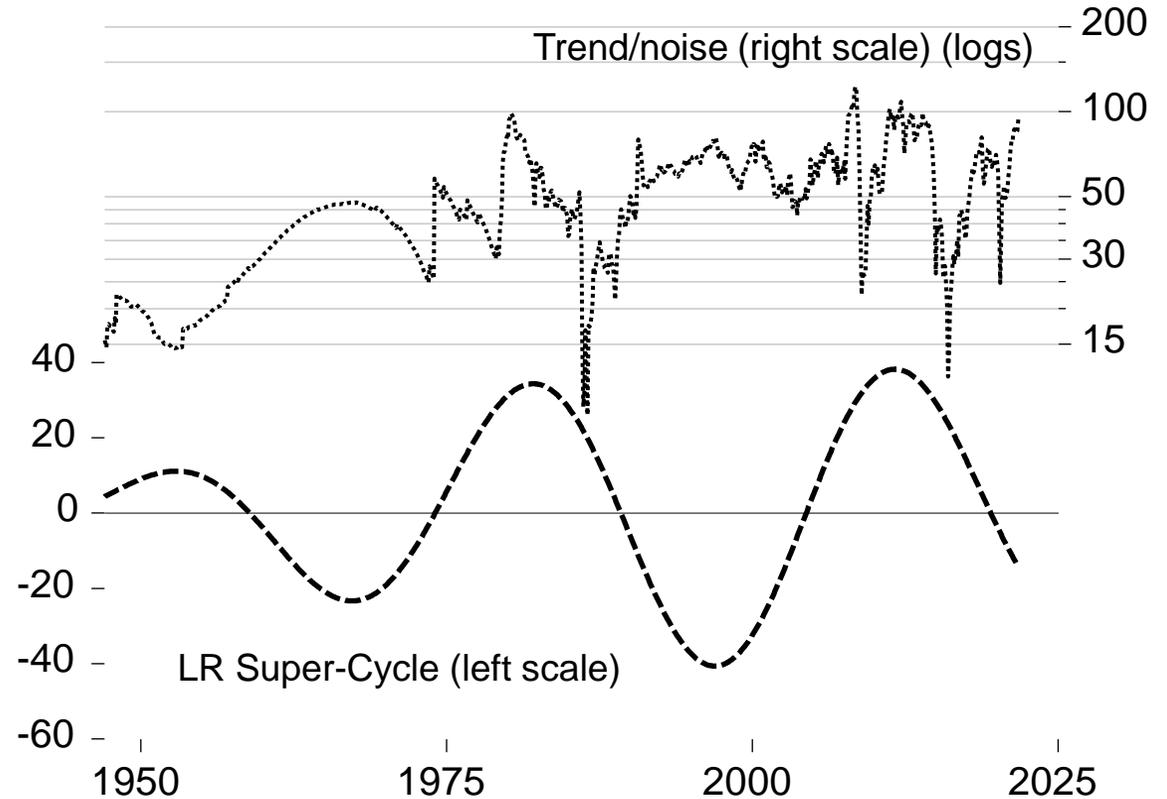
# Those who forget the past are condemned to retweet it: oil prices simply returned to pre-covid levels before Russia invaded Ukraine

Daily, dollars/barrel



Brent crude oil prices (current dollars)  
May 2, 1987 – June 6, 2022

Asymmetric (time-varying) filter, monthly \$/bbl



Constant (2021)-dollar monthly long-run crude oil price cyclical and noncyclical decompositions

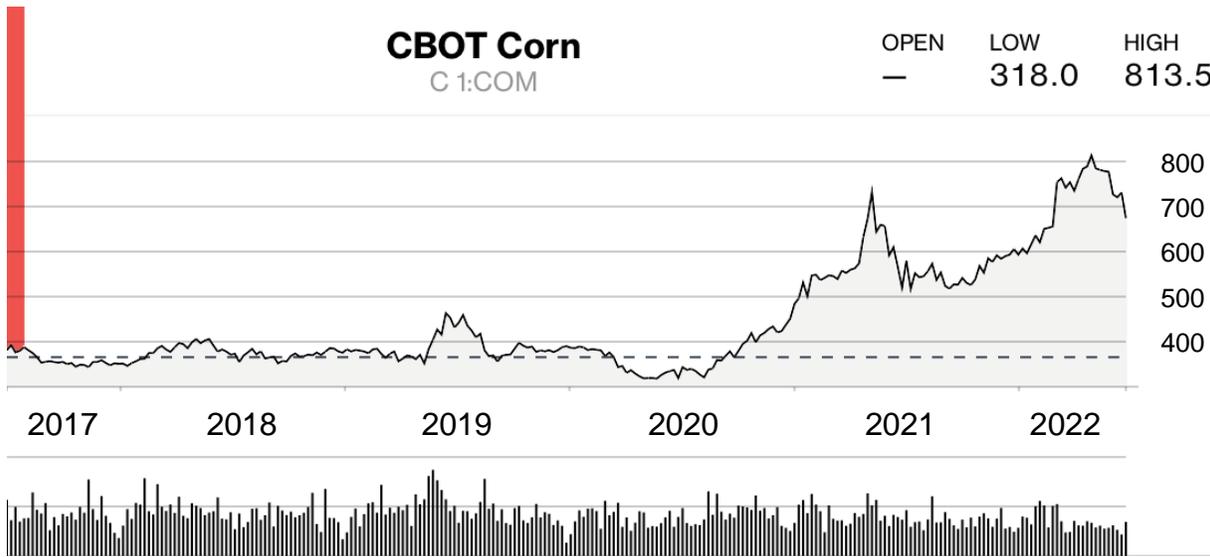
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# Chicago Board of Trade corn (maize) futures now in decline (again), should provide relief in producer prices over coming months

Daily, US cents/bushel

**CBOT Corn**  
C1:COM

OPEN	LOW	HIGH
—	318.0	813.5



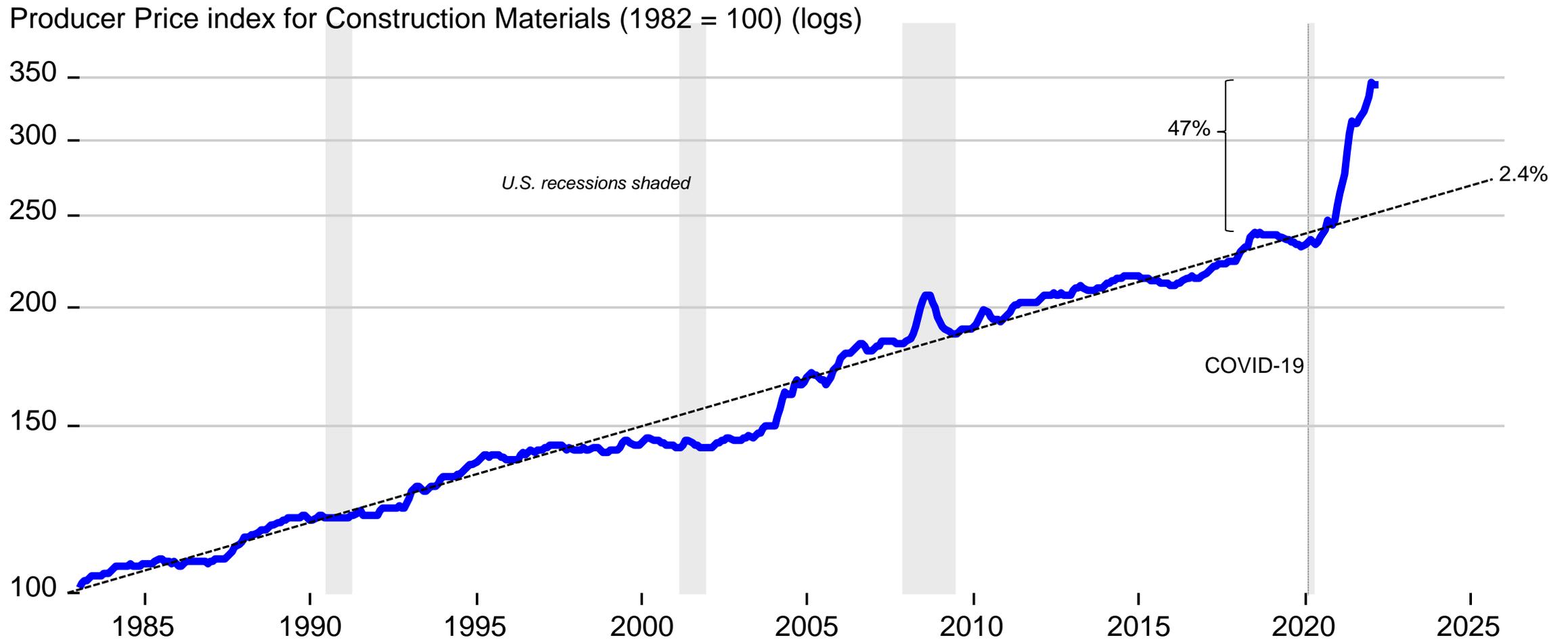
Corn commodity futures

Monthly index (1992 = 100, log scale)

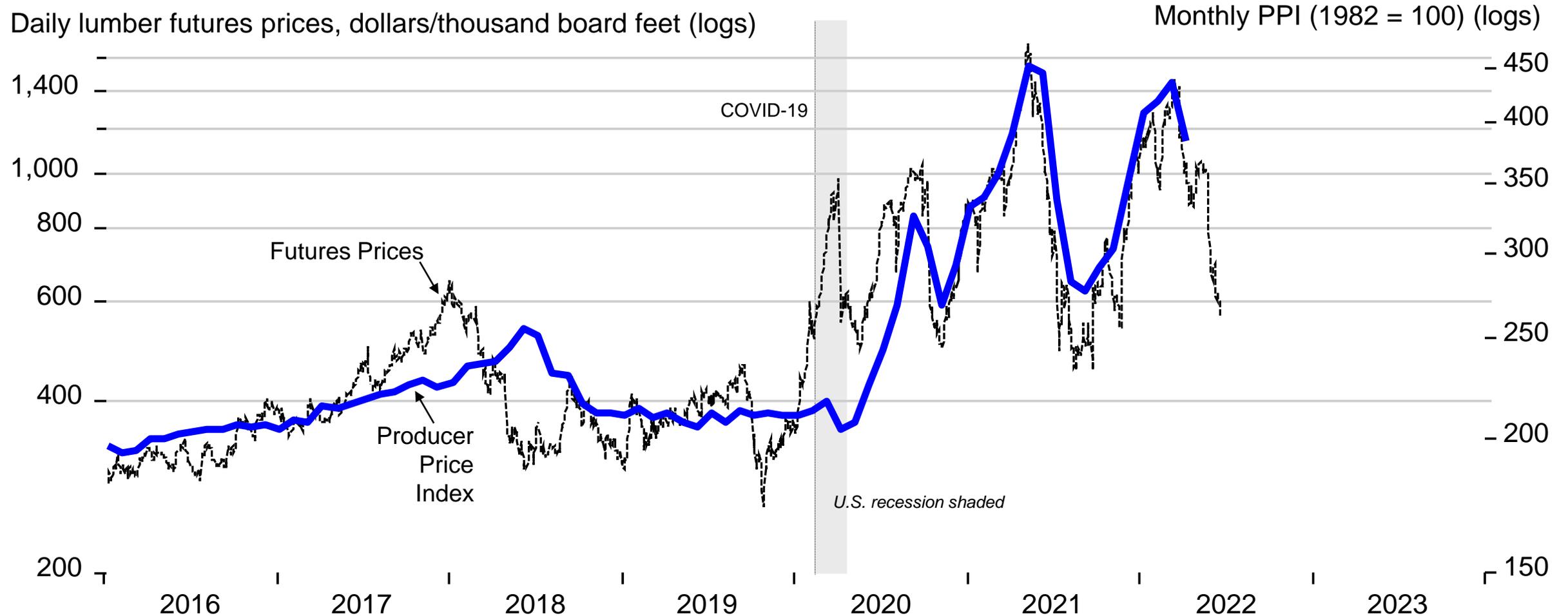


Producer Price Index for Corn

# U.S. Producer Price Index for Construction Materials well above historical inflation rate of 2.4 percent; recent stabilization (2022)

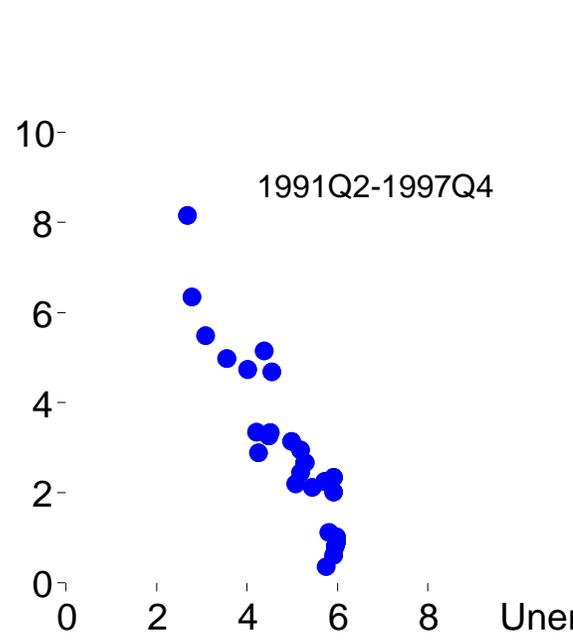
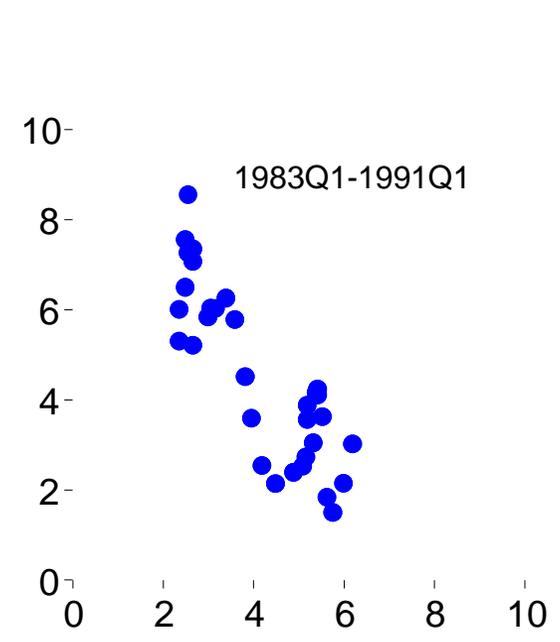
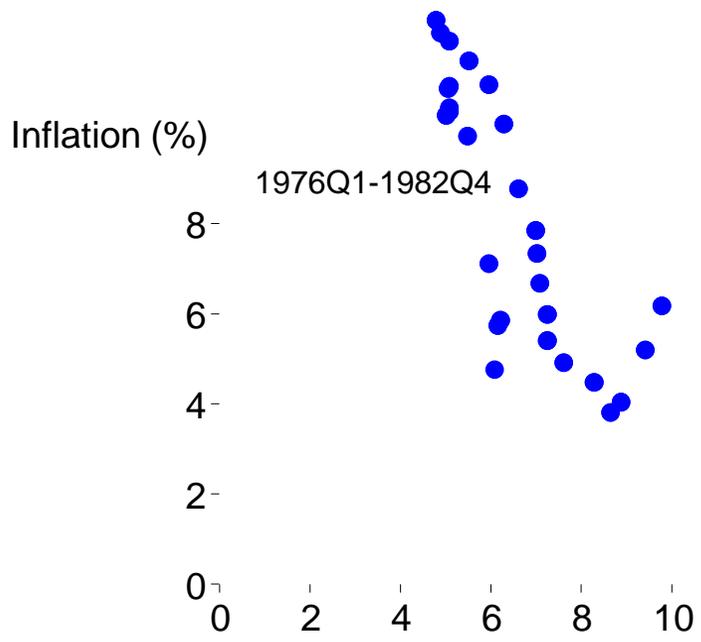


# Lumber futures prices, PPI for lumber volatile since COVID-19 but should settle as resolution supply chain disruptions continues

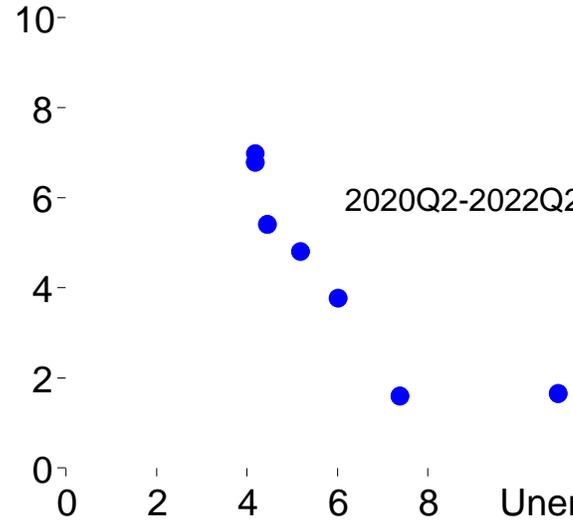
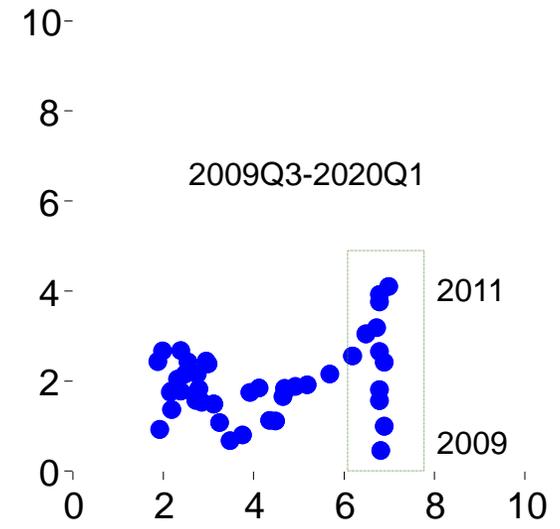
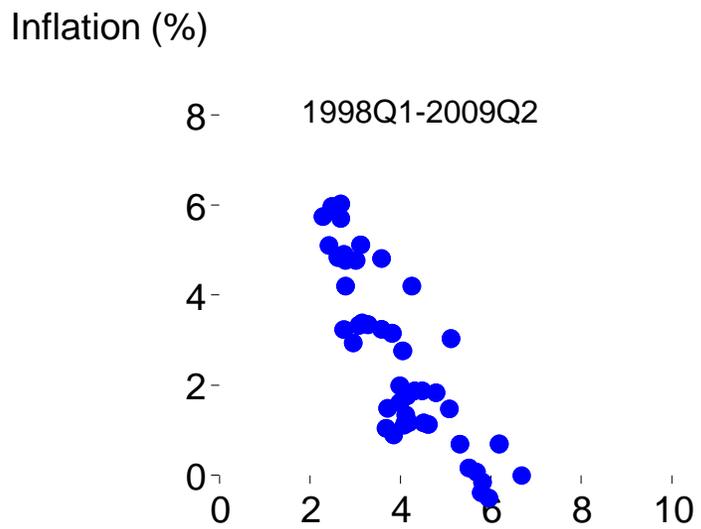


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Source: Chicago Mercantile Exchange, Random Length Lumber Futures, via Yahoo Finance (<https://finance.yahoo.com/quote/LBS%3DF/history?p=LBS%3DF>), daily closing prices through June 9, 2022, U.S. Bureau of Labor Statistics, Producer Price Index by Commodity: Lumber and Wood Products: Lumber [WPS081], monthly data through April 2022 from FRB of St. Louis (<https://fred.stlouisfed.org/series/WPS081>).



Urban Hawaii Phillips  
Curves largely validate  
theoretical inverse  
relationship between  
inflation, unemployment  
("flattest in 2010s")



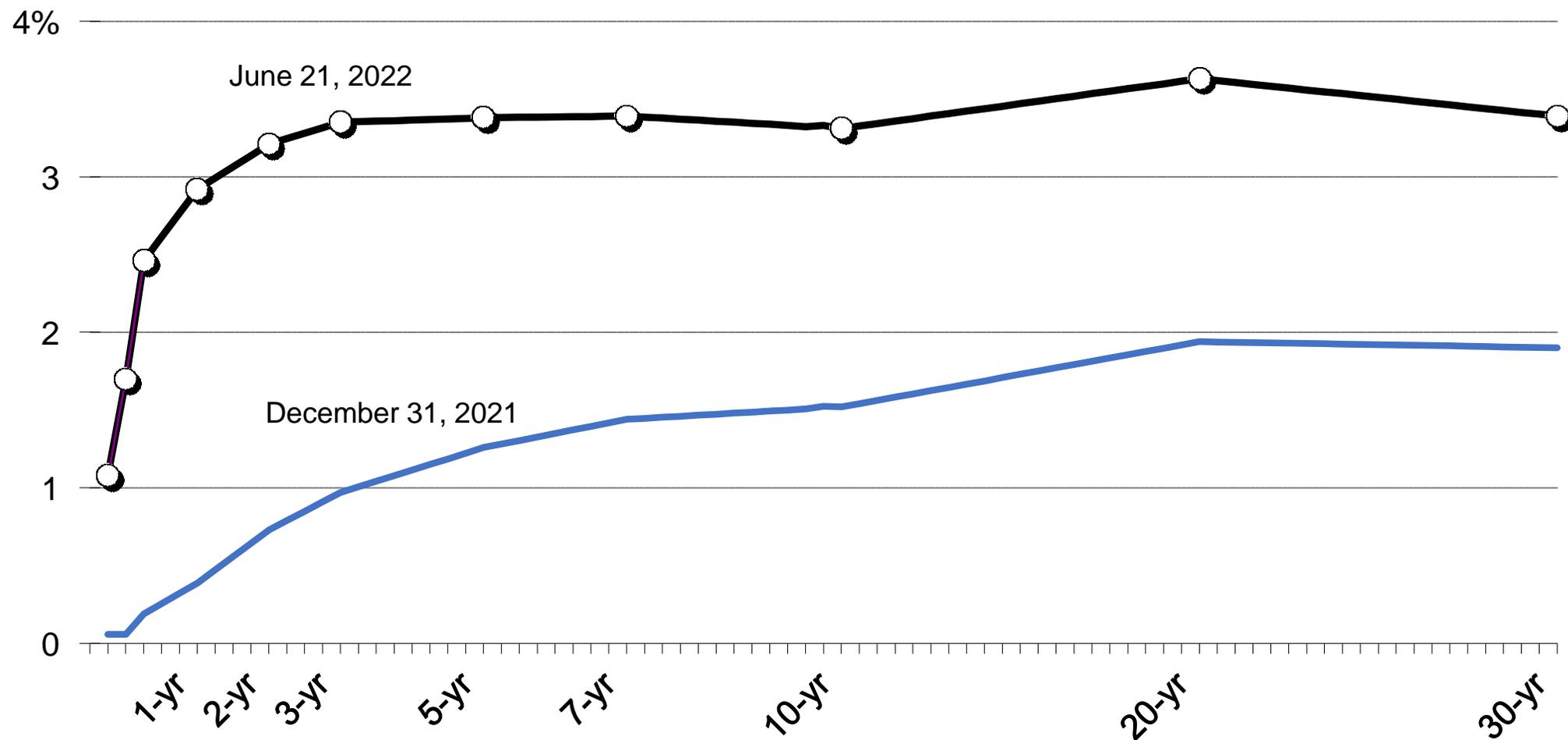
COVID-19 pandemic



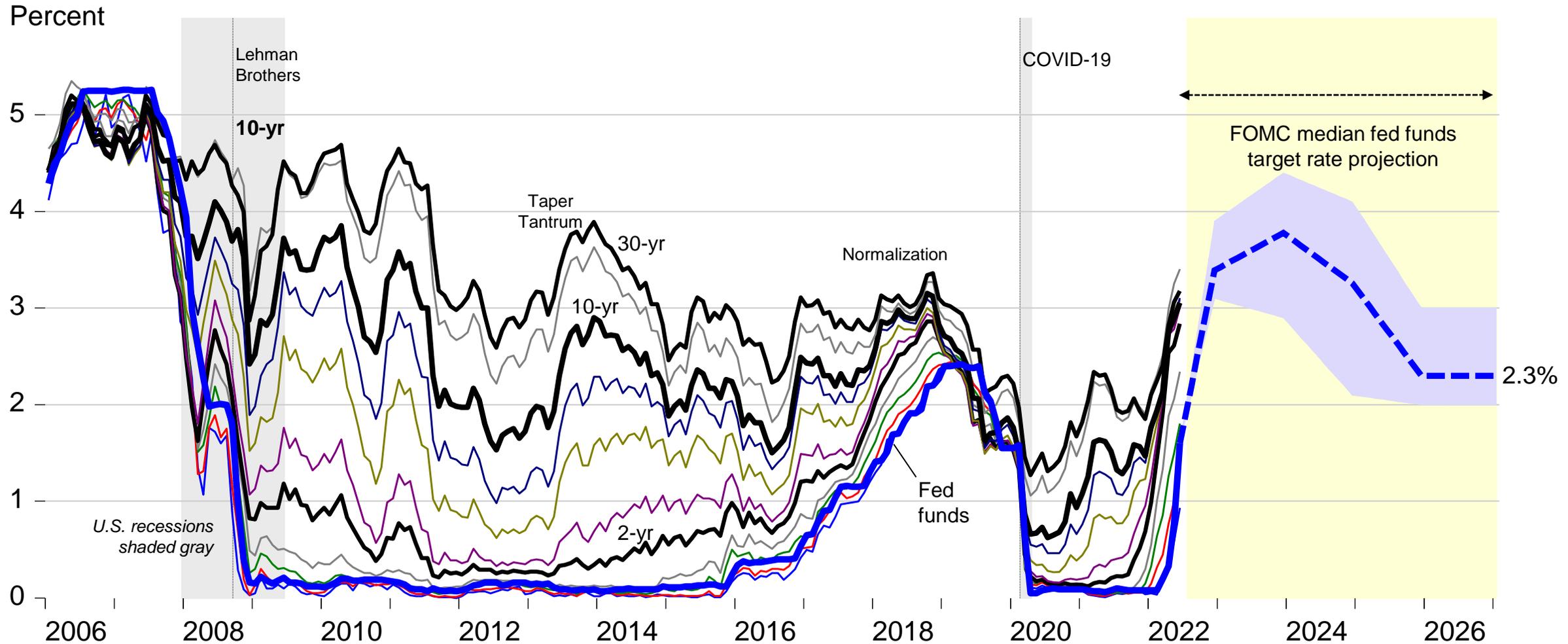
## Monetary policy transition to lift-off

- FOMC now cranking the overnight lending rate target +75 basis points/meeting: fed funds rate (SOFR will match) by 2023 to overnight rate in range of 3-4%
- Long end of yield curve already (End Game) waiting at 3.0-3.5% (forward guidance)
- Inflation expectations (“breakeven inflation rates”) still well-anchored (given AIT)
- Quantitative tightening details: \$30 bil./month Treasuries maturing, \$17.5 bil./month MBS maturing; more liquidity minutiae—reverse repo bid/offer rate 1.55/1.75%

# U.S. Treasury yield curve flattened substantially over first half 2022

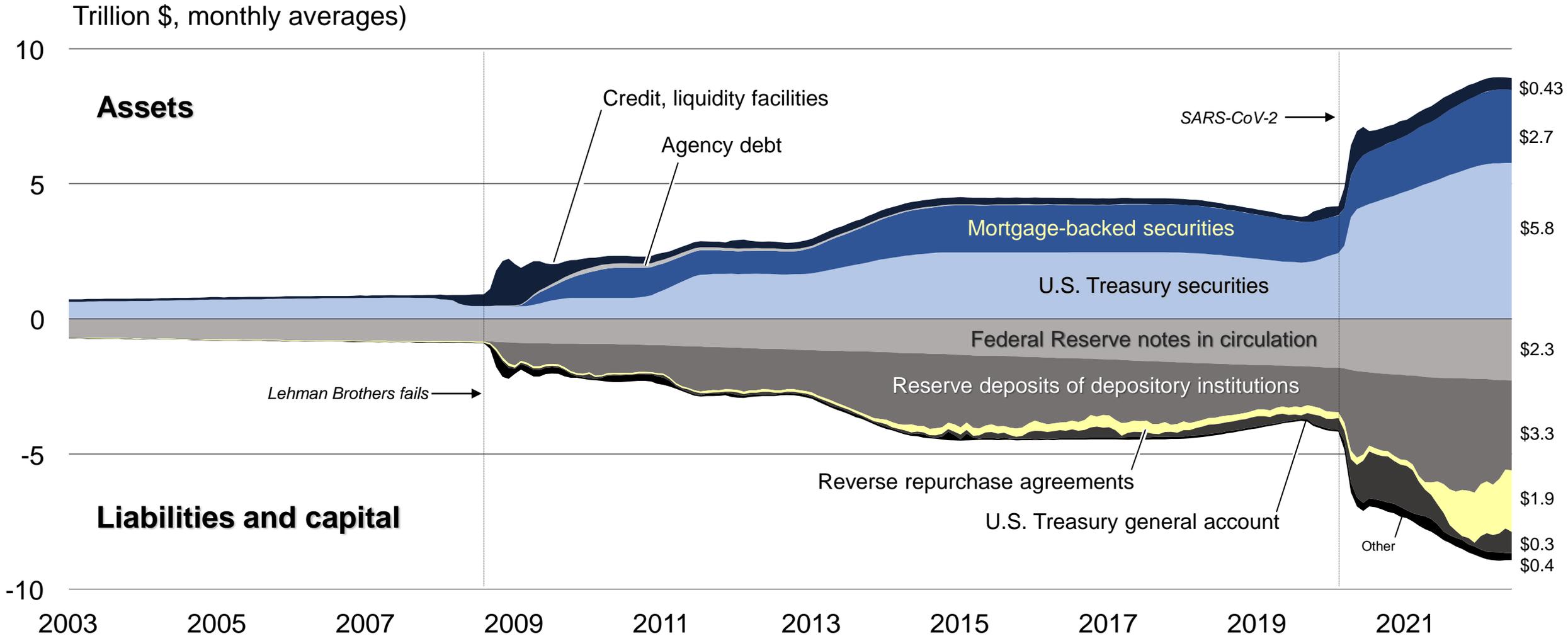


# Nominal U.S. Treasury yield curve: FOMC moving aggressively to contain aggregate demand pressure on inflation, anchor expectations



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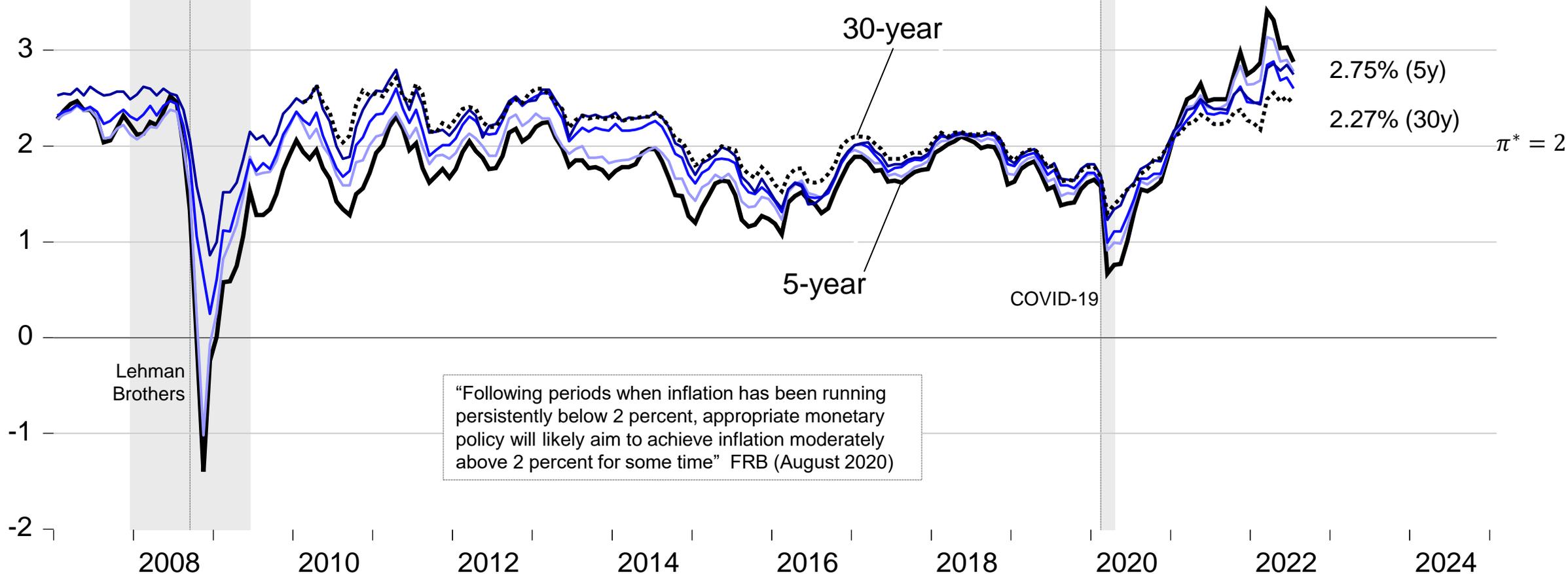
# Next steps for monetary policy: (1) tapering asset purchases; (2) fed funds rate lift-off; (3) balance sheet run-off (in that order, sequentially)



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# Why this is not the 1970s: (nominal – real) U.S. Treasury yields: long run inflation expectations $\pi^e \leq 2.75\%$ remain well-anchored

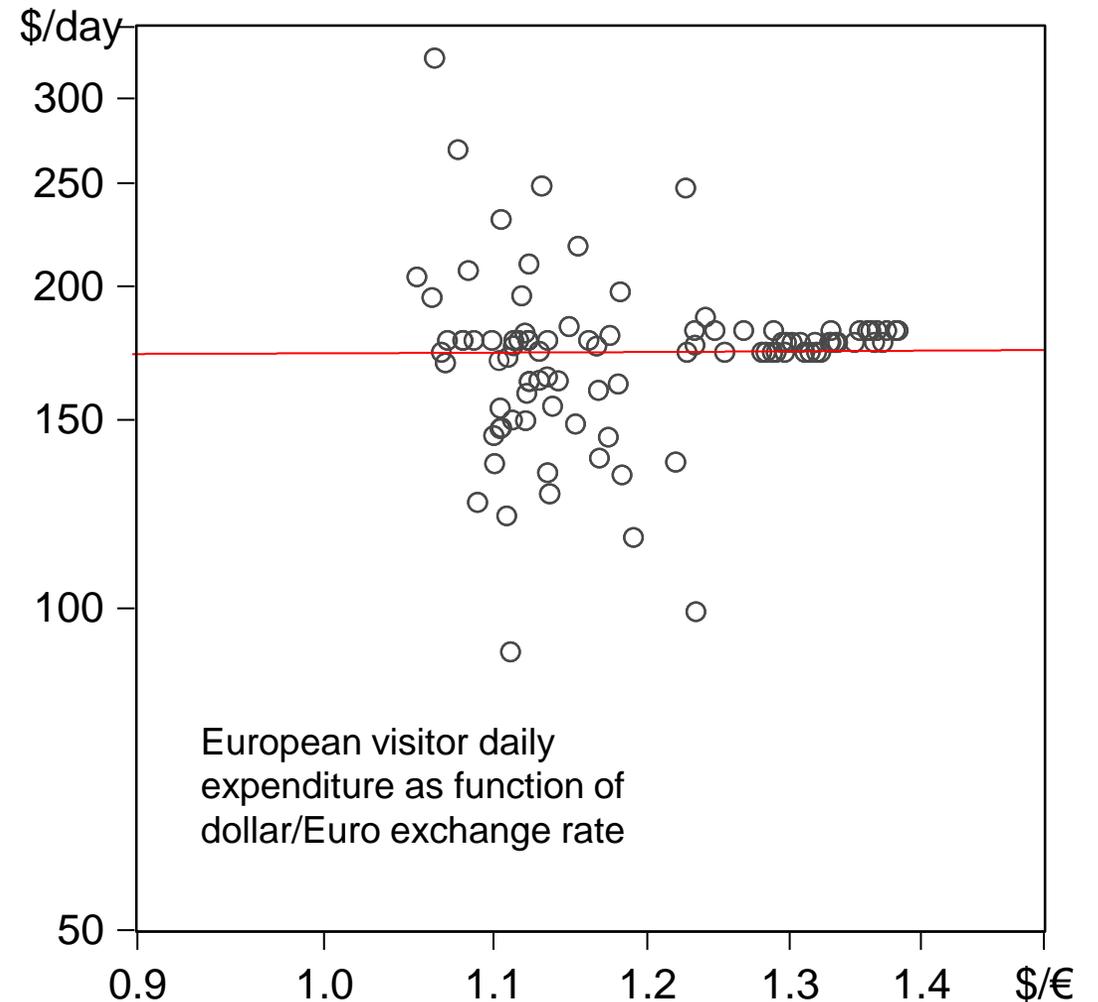
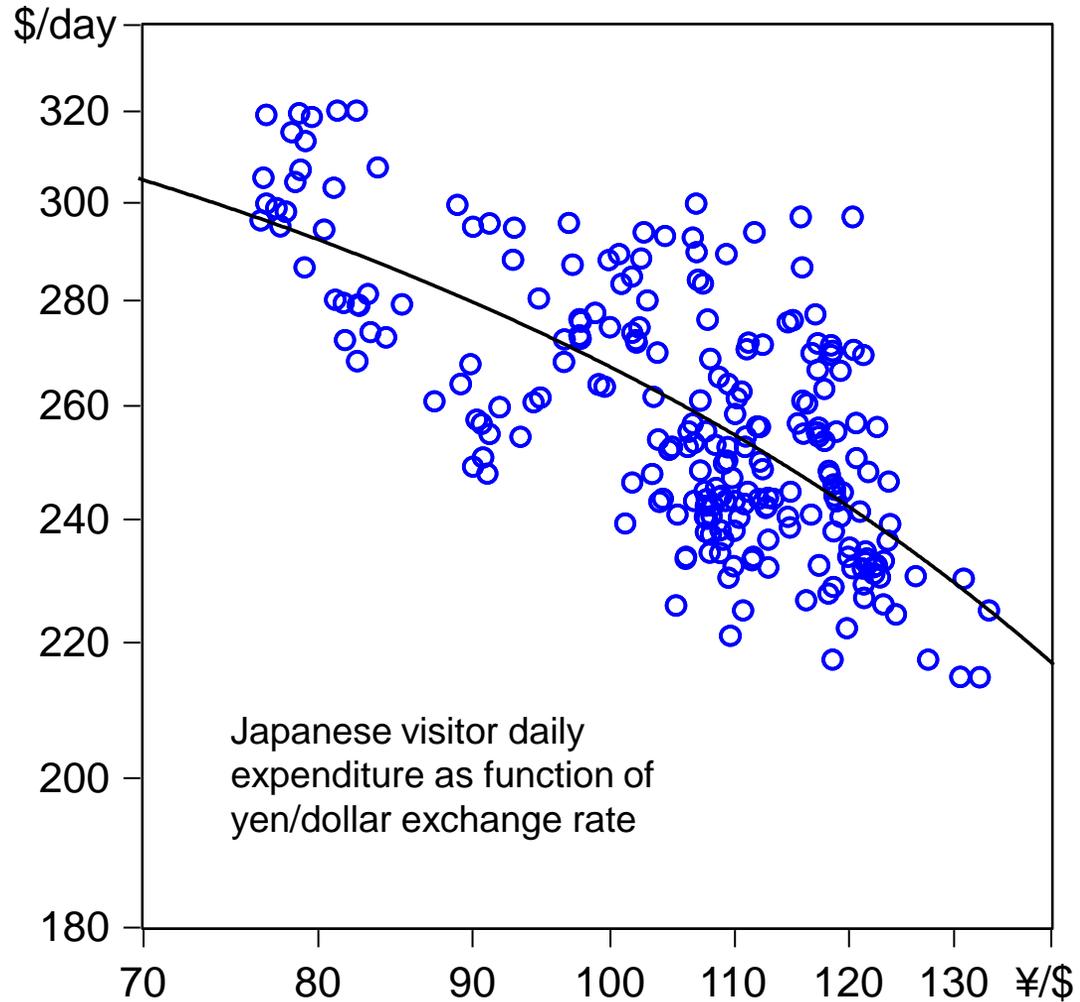
Term structure of expected inflation from nominal Treasury minus TIPS yields



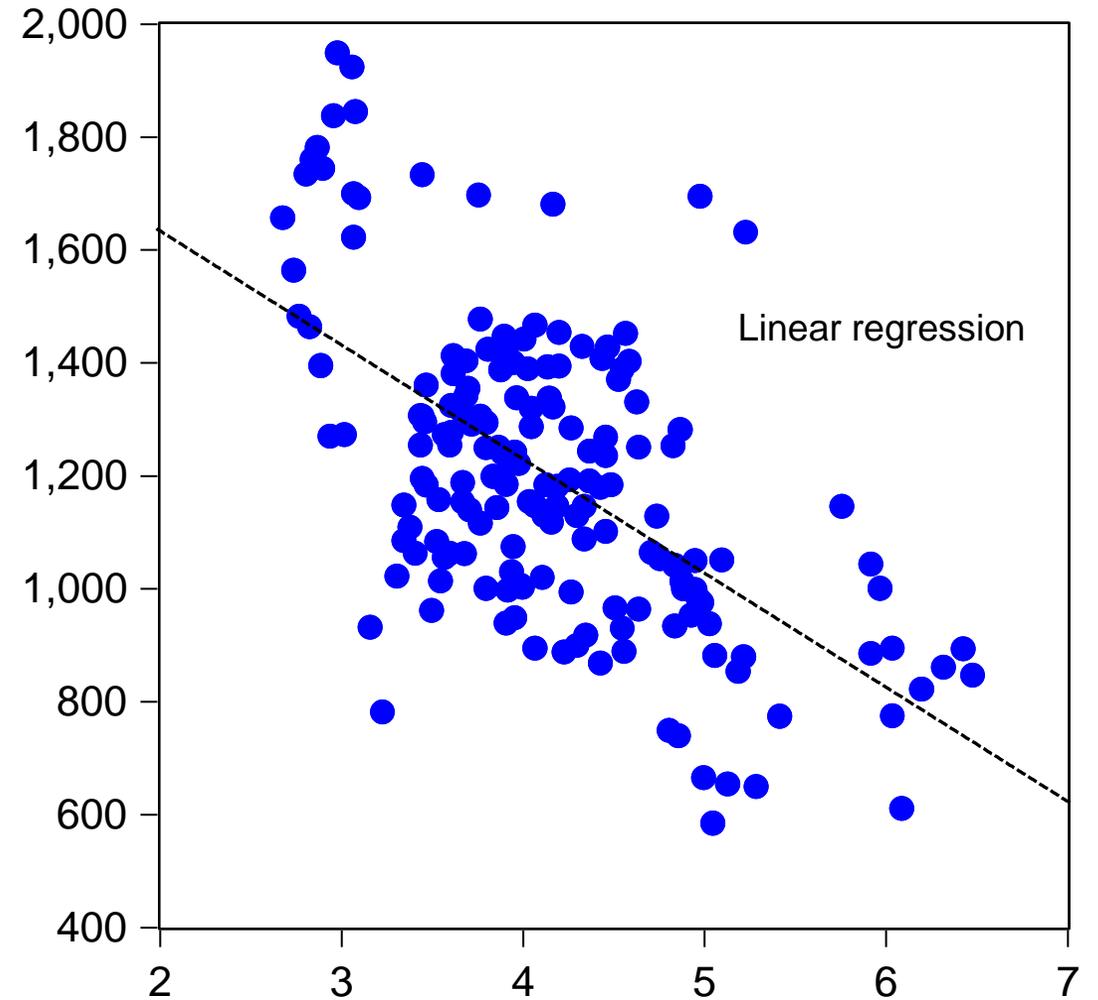
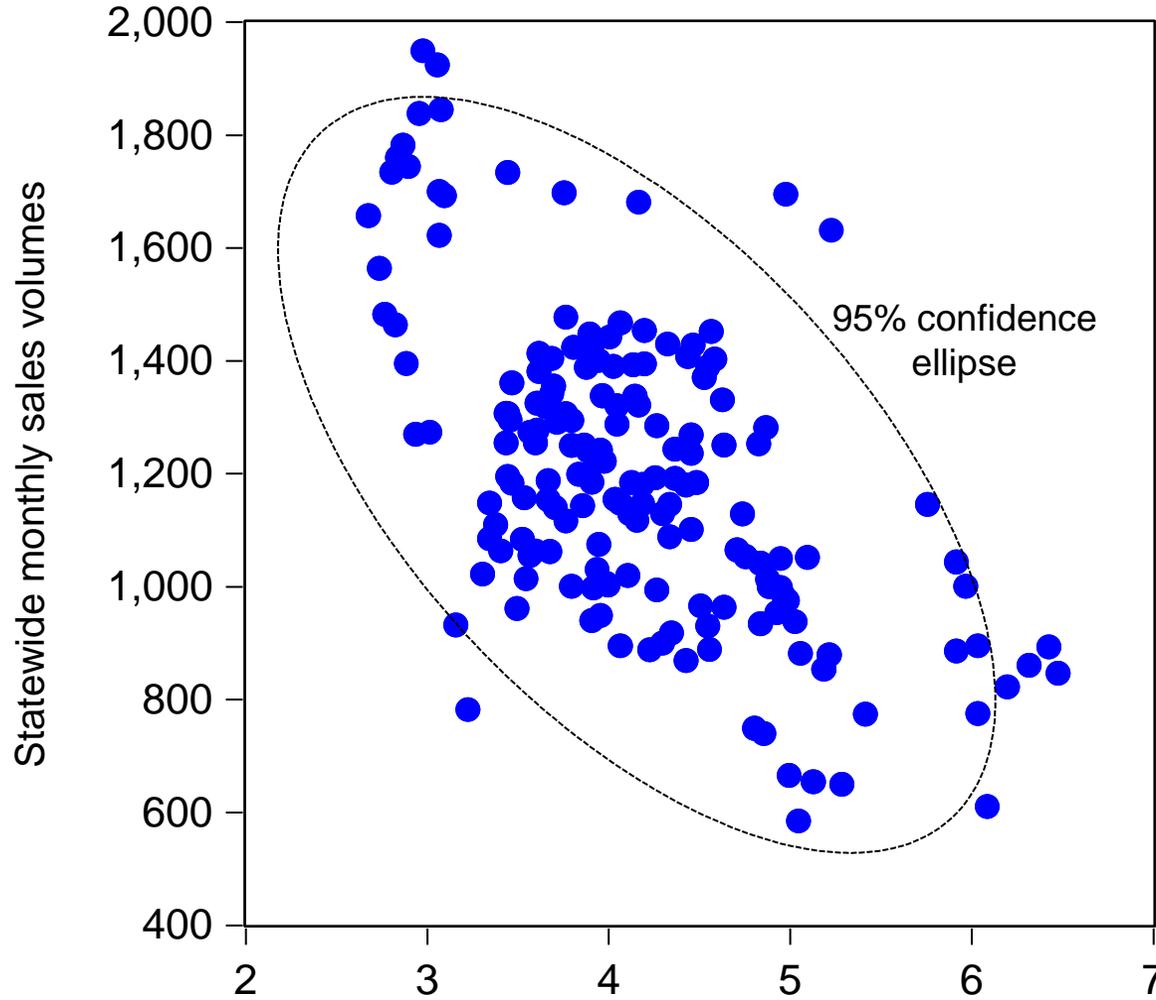
\*Nominal U.S. Treasury yields minus TIPS yields at same maturities

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# Another transmission channel for interest rates: strong dollar reduces Japanese daily visitor expenditure (elasticity c. $-0.4$ ); Euro ambiguous

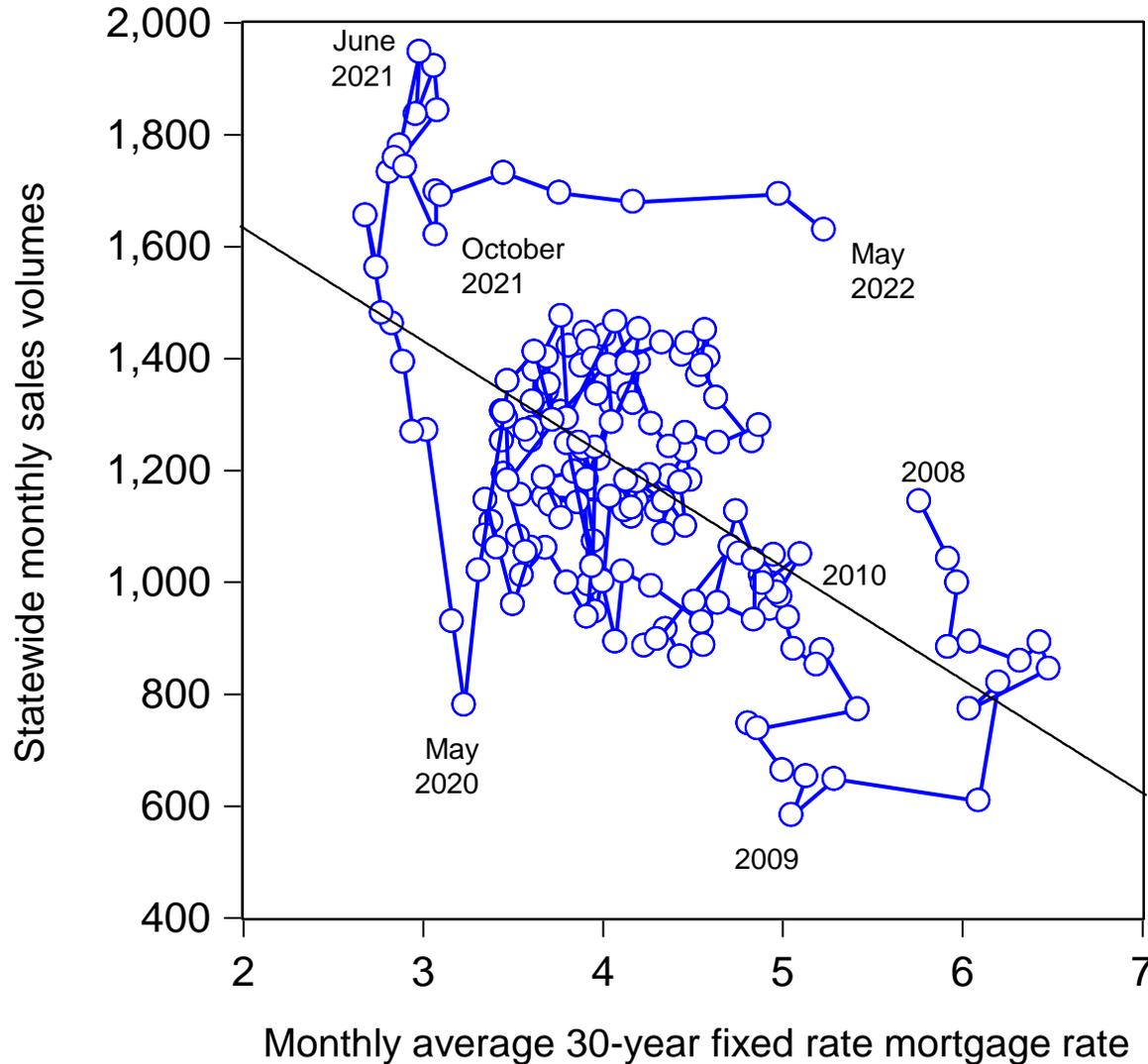


# Inverse relationship between Hawaii home sales and mortgage interest rates (2008-2022(May))



Monthly average 30-year fixed rate mortgage rate

# Inverse relationship between Hawaii home sales and mortgage interest rates (2008-2022(May))

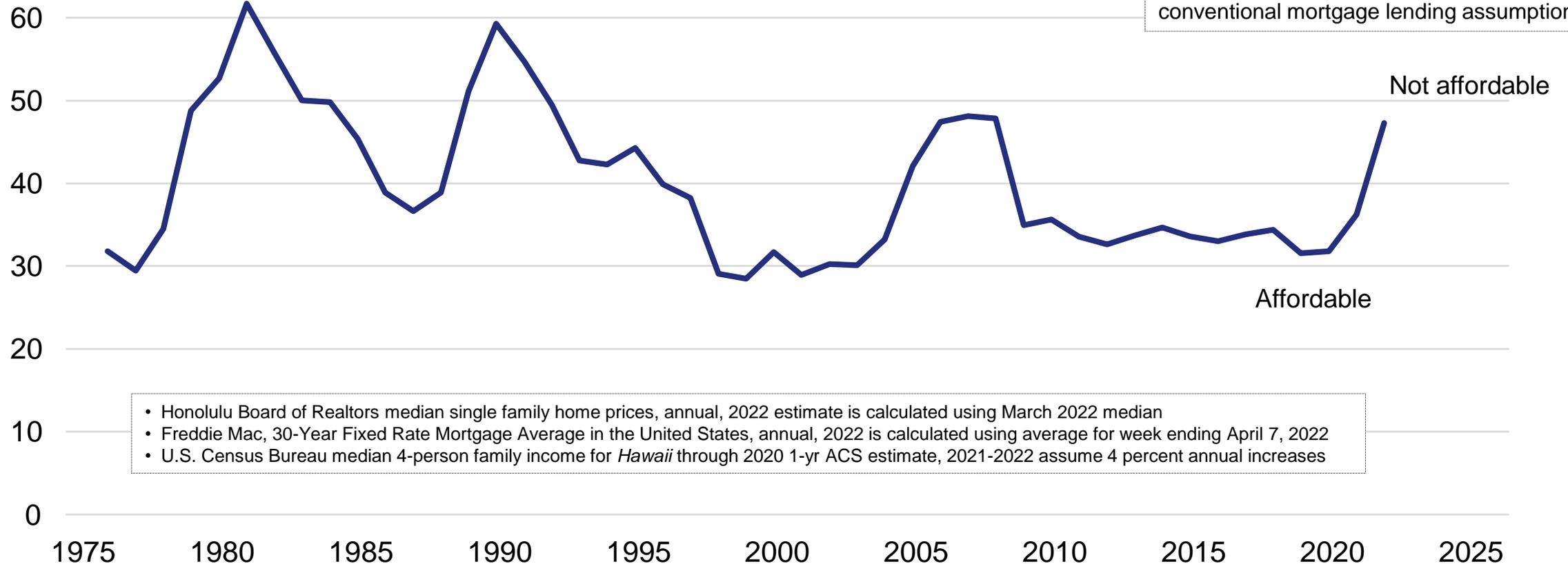


Ignoring other factors (*ceteris paribus*), over the last decade of relatively steady existing home sales growth (the “escalator,” not “roller coaster”), each percentage point increase in the 30-year fixed rate mortgage interest rate was associated with about a 15-20 percent decrease in sales.

But other factors *are not equal*, and one version of the housing cycle is evident in the sometime *clockwise* rotation of data in this scatterplot over specific intervals of time. Two intervals provide notable bookends: (1) The Great Recession (2008-2009); and (2) the post-covid mini-bubble (summer 2020 through summer 2021). The long tail of the latter (literally, through spring 2022), looks ripe for a hard right turn after a doubling of mortgage interest rates.

# Oahu single-family housing affordability through 2021 FH with 20% down at 4-person HUD median income / required (0.31), 30-yr FRM

Oahu mortgage payment (30y FRM) as percent of median 4-person family income

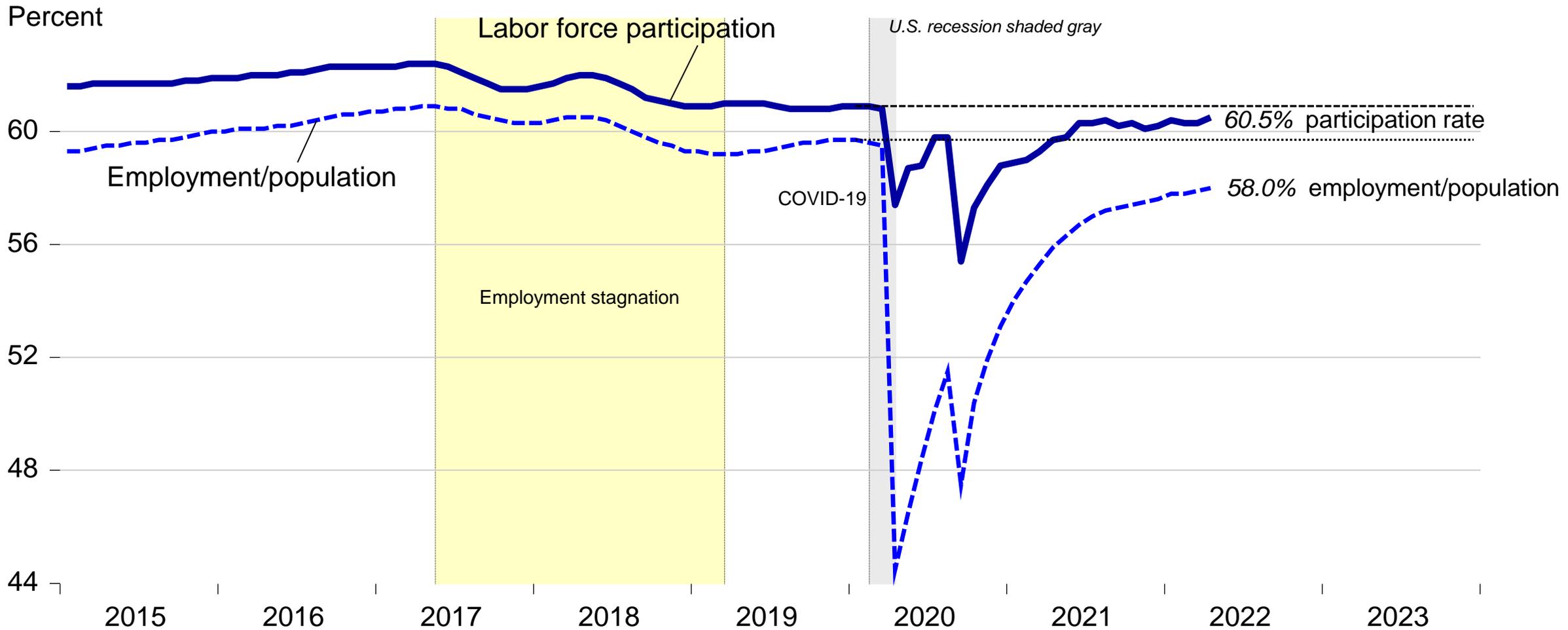




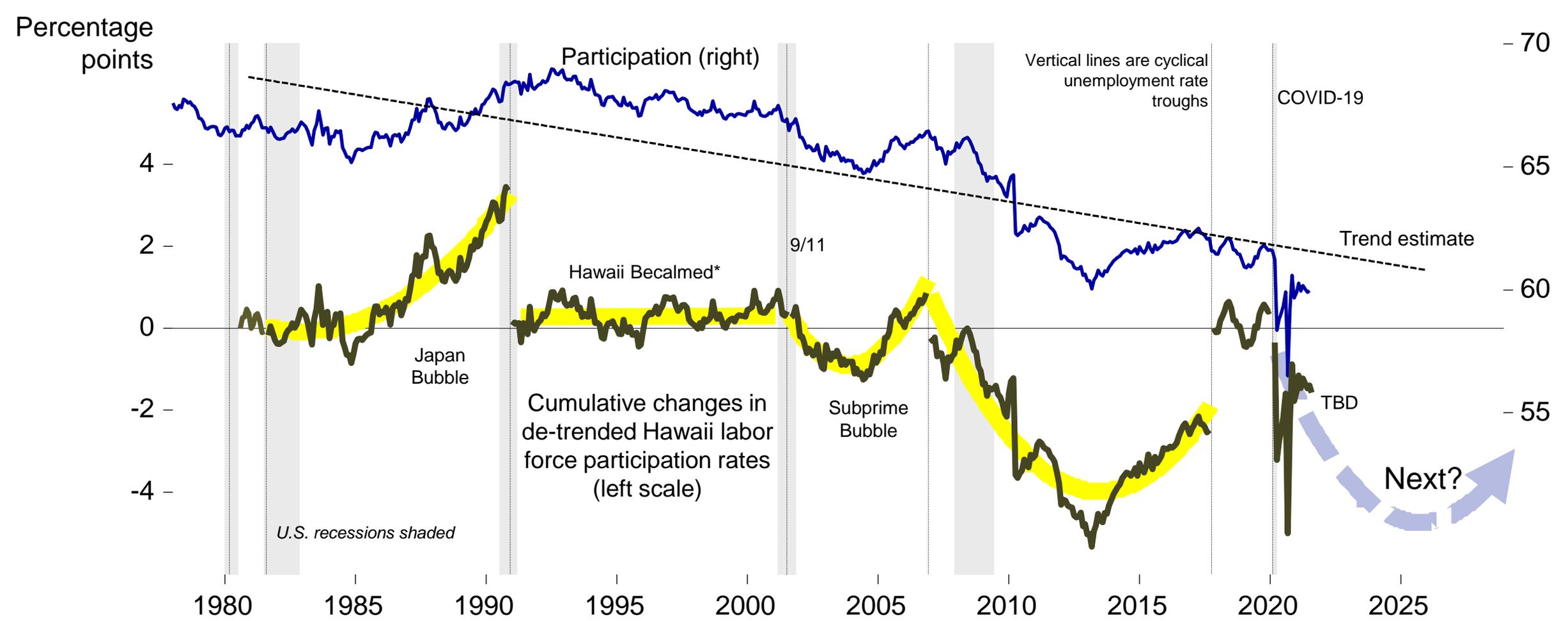
# Post-pandemic labor markets

- Labor force participation in Hawaii still down 2 percentage points from pre-covid—possibility that 2020s will be constrained by pandemic legacy (exit—see ya!)
- Hawaii employment gains fading, real wage growth eroding, unemployment stabilizing
- Jelige da mainland: job openings way higher than normal, given unemployment rate
- The Great Resignation: Hawaii in last year leading the nation in quits in many months
- Also true: dem buggahs nevah going back to da office (tell your HR Police)—remote work is here to stay and all the Smart Kids are doing it, maybe 20 percent of workers

# Post-Covid Hawaii participation rates, employment rates, falling short of pre-Covid benchmarks, diminished by similar factors (e.g. aging)



# Procyclical movement in de-trended *Hawaii* labor force participation rates (%), zeroed at each unemployment rate trough (vertical lines)



\*Christopher Grandy (2002), *Hawaii Becalmed: Economic Lessons of the 1990s*, University of Hawaii Press

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Source: Hawaii DLIR ([https://files.hawaii.gov/dbedt/economic/data\\_reports/DLIR/LFR\\_LAUS\\_LF.xls](https://files.hawaii.gov/dbedt/economic/data_reports/DLIR/LFR_LAUS_LF.xls)), seasonal adjusted using X-13 ARIMA filter, de-trended from January 1976 – June 2017 and projected through 2026, with interval nonlinear regressions from trough-to-trough unemployment rates 1981M08-1990M12, 2006M12-2006M12, and 2007M01- 2017M10 by TZE.

# “Stop enhanced unemployment insurance and people will return to work”

–Every Chamber of Commerce in Murica

“Almost all of the decline in the [labor force] participation rate since the onset of the pandemic is due to changes in job-loss and job-finding rates and thus accounted for by the participation cycle. This is not only true in the aggregate, but also for all of the groups we consider [*i.e.* by sex, age, education, race and ethnicity]. ... We show that these similarities in the source of the participation declines across groups is indicative of a broader pattern: The very uneven effect of COVID-19 on different groups in 2020 largely has subsided in 2021.”

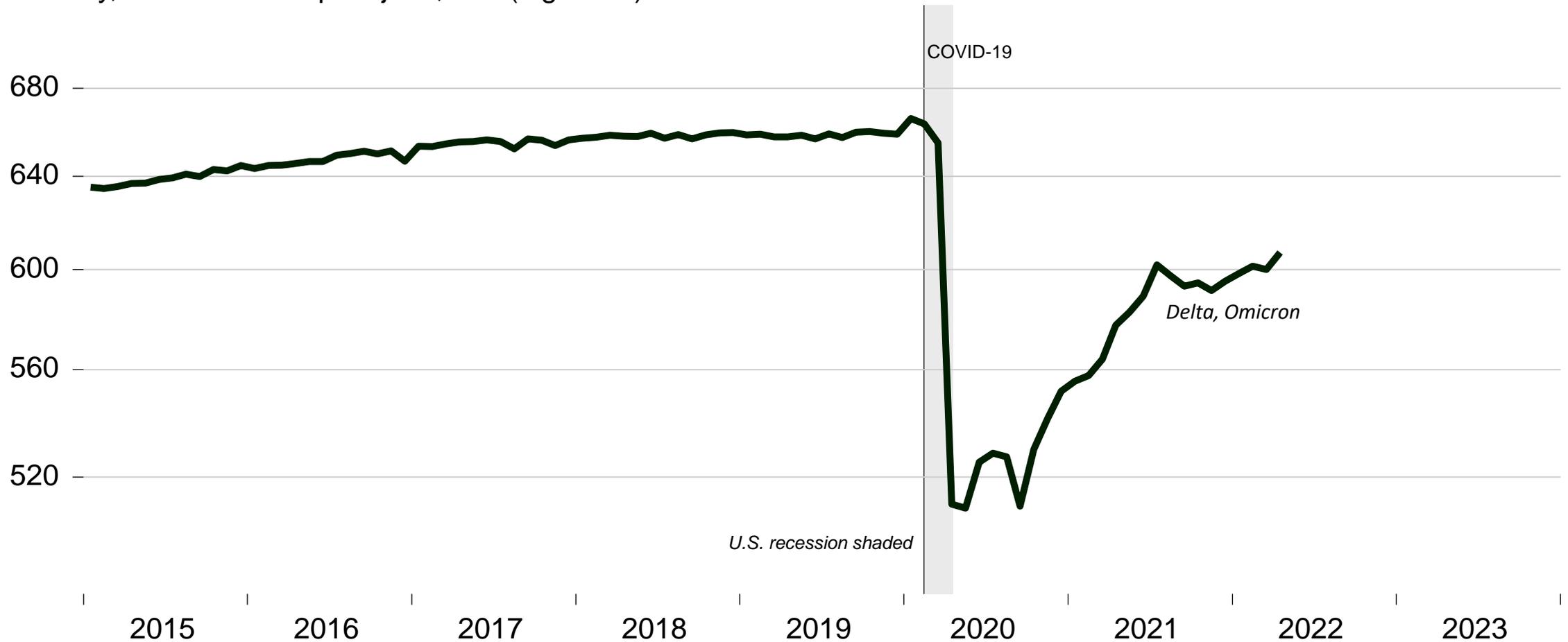
“A longer-run historical comparison ... reveals that both the unemployment rate and participation cycle in June 2021 are comparable with those in the early fall of 2014. Using the labor market expansion after 2014 as a baseline, we show that the participation cycle is likely to lag the recovery in the unemployment rate in coming years, just like it did in previous recoveries.”

–Hobijn and Şahin (September 2021) “Maximum Employment and the Participation Cycle”

Note: “The measurement of the participation cycle does not require an estimate of the trend participation rate” (Hobijn and Şahin (2021)) so the illustration in the next slide is for heuristic purposes, only

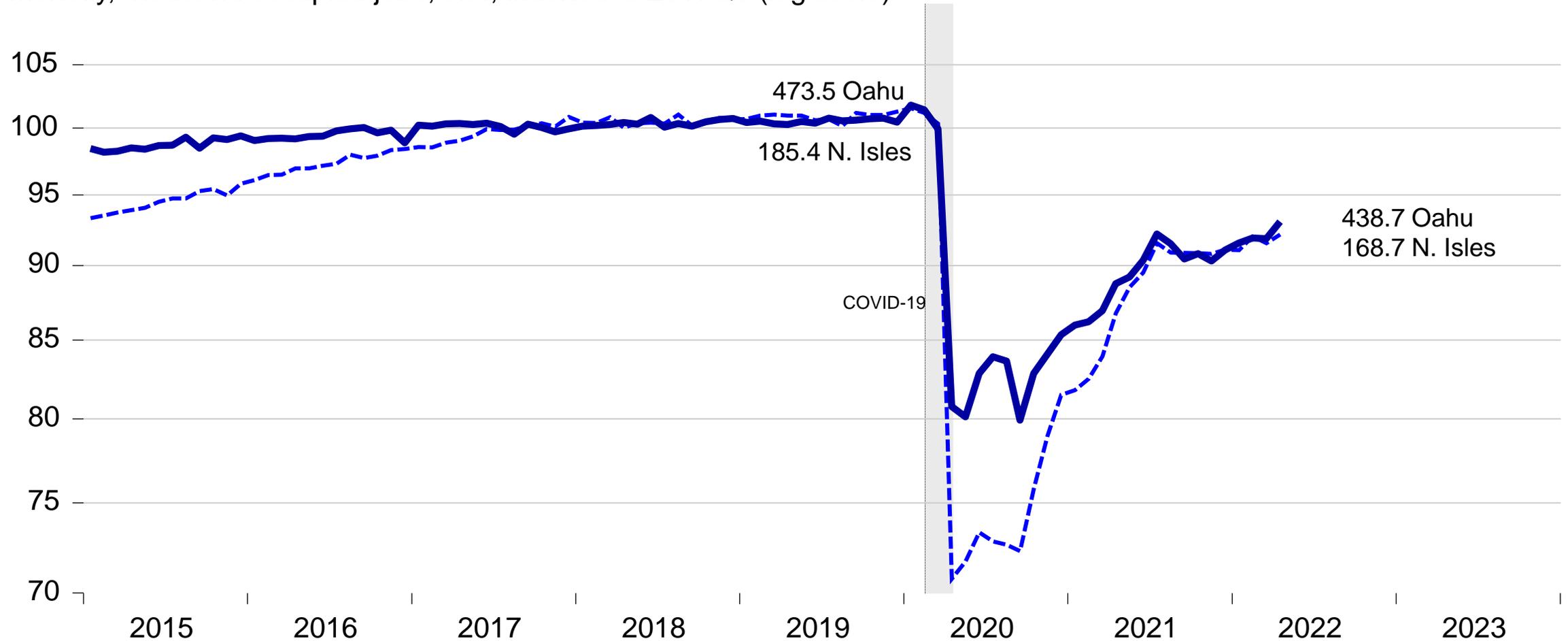
# Payroll employment in Hawaii still “only” 92-93 percent of end-2010s occupied jobs, but recovery throttled by COVID-19 variant waves

Monthly, thousand occupied jobs, s.a. (log scale)



# Neighbor Island jobs took a bigger hit than Oahu before COVID-19 vaccines released; now there are more than 50,000 jobs still missing

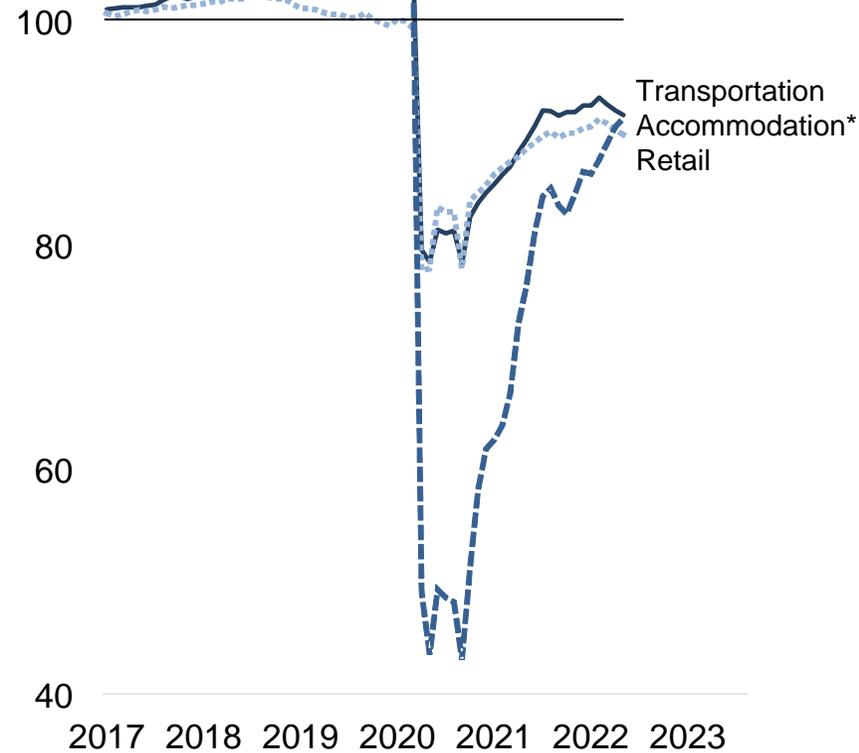
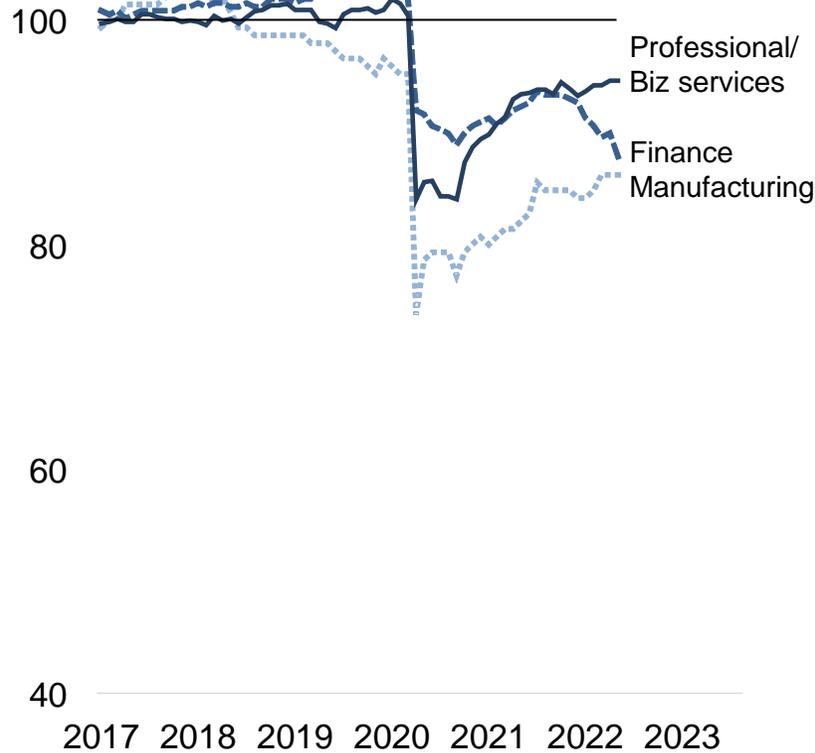
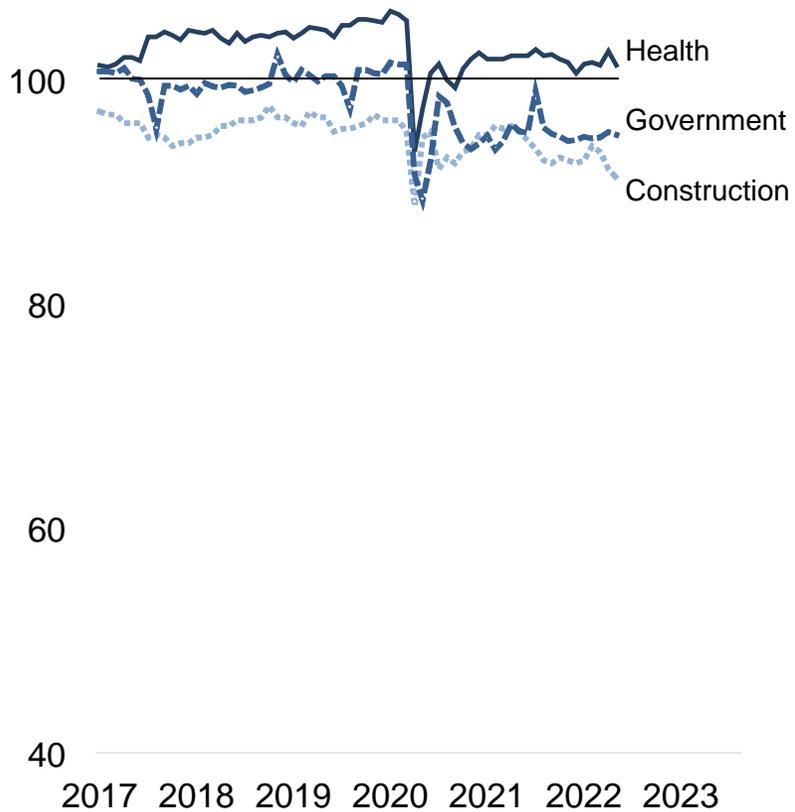
Monthly, thousand occupied jobs, s.a., indexed to 2017Q3 (log scale)



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# Statewide jobs by selected industries exhibit some of the “stalling” in economic recovery, and probably some structural changes as well

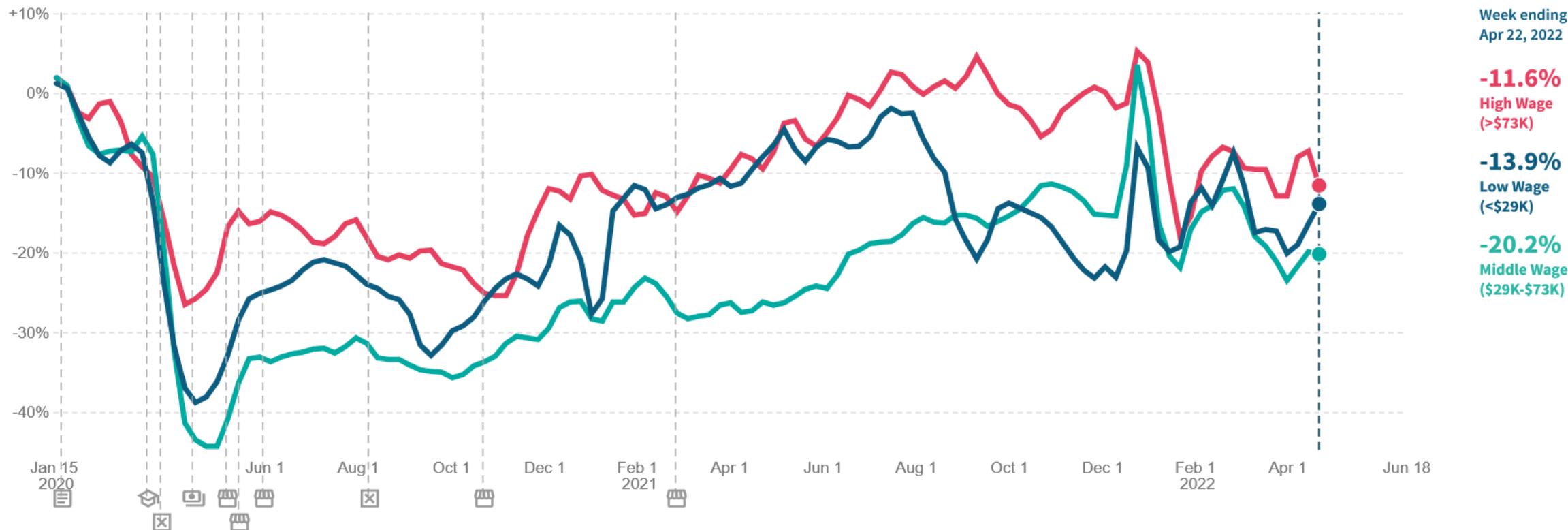
Monthly indexes (2016 = 100, s.a.)



\*Including food services

## Percent Change in Employment\*

In **Hawaii**, as of **April 22 2022**, employment rates among workers in the bottom wage quartile **decreased** by **13.9%** compared to January 2020 (not seasonally adjusted).



data source: **Earnin, Intuit, Kronos, Paychex**

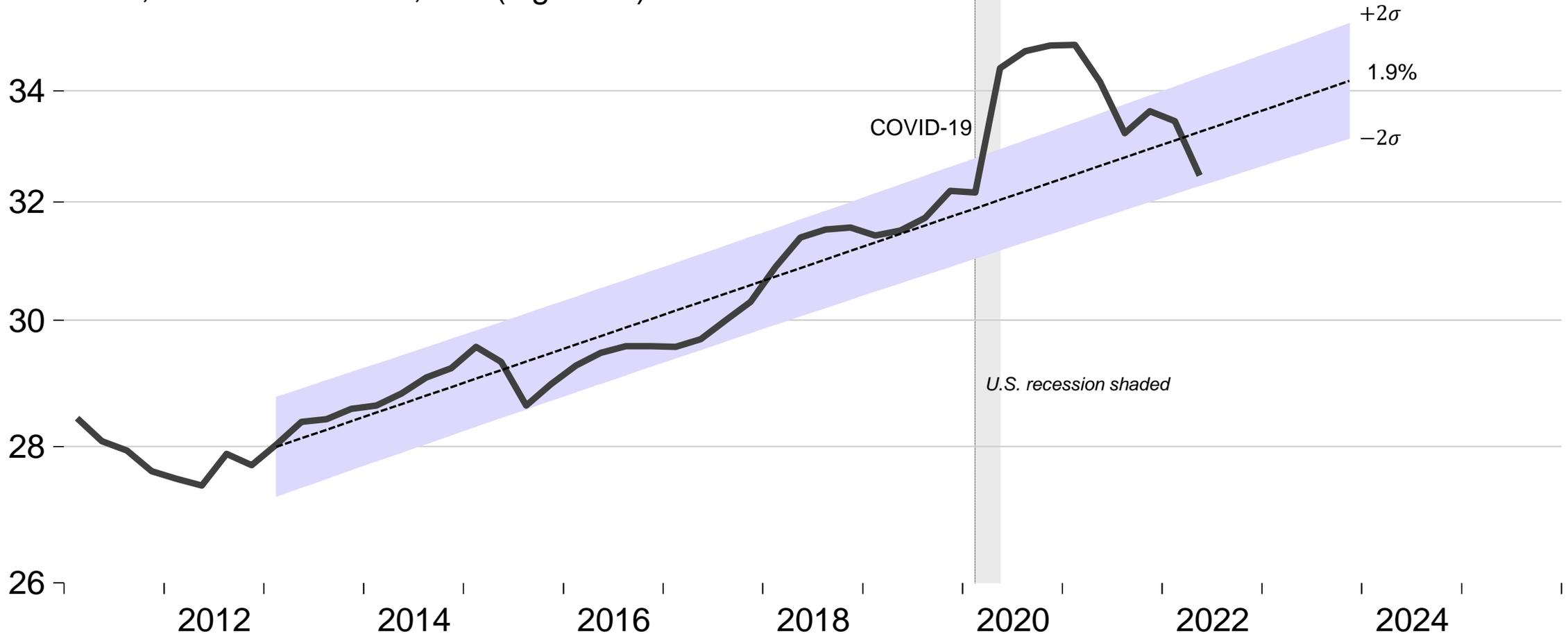
\*Change in employment rates (not seasonally adjusted), indexed to January 4-31, 2020. This series is based on payroll data from Paychex and Intuit, worker-level data on employment and earnings from Earnin, and timesheet data from Kronos. The dotted line is a prediction of employment rates based on Kronos and Paychex data.

last updated: **June 17, 2022** next update expected: **June 24, 2022**

visit [tracktherecovery.org](https://tracktherecovery.org) to explore

# Hawaii metro area real average hourly earnings rose 1.9% *p.a.* pre-covid, jumped with low-wage covid job loss; recent inflation erosion

Constant, 2021 dollars/hour, s.a. (log scale)

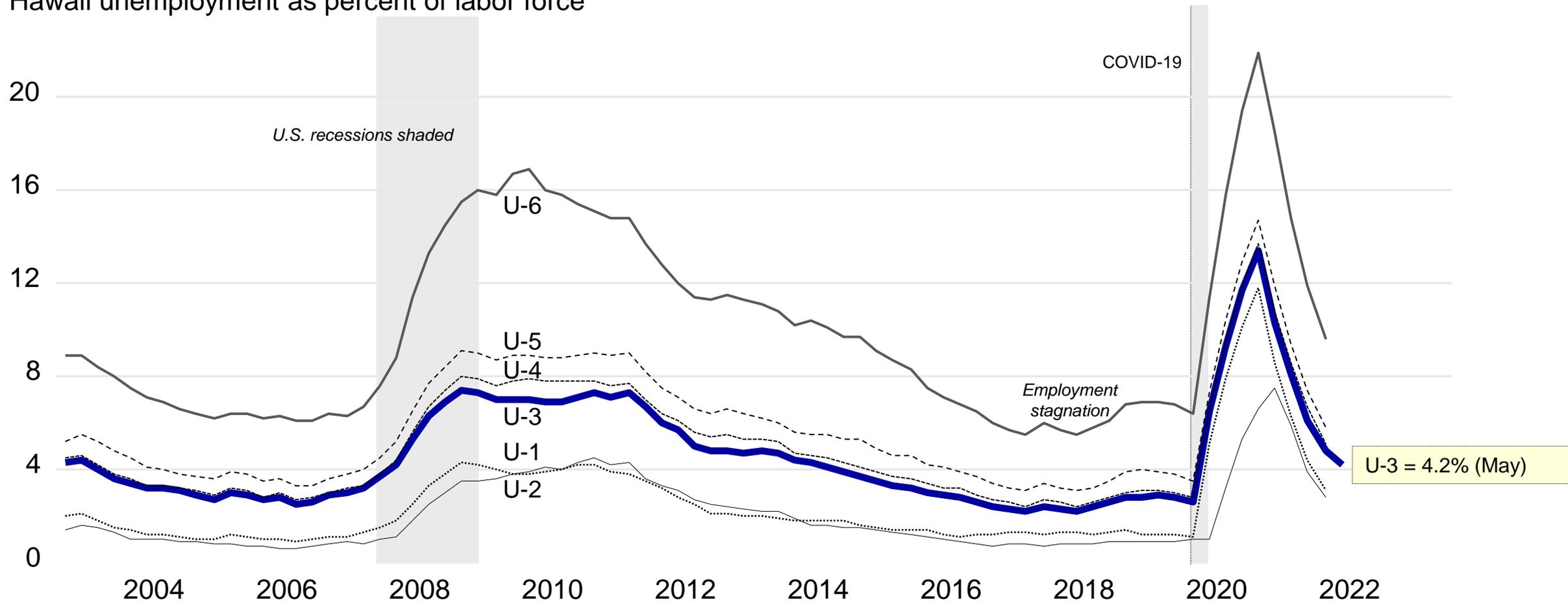


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Source: Hawaii DBEDT (<http://dbedt.hawaii.gov/economic/hours-and-earnings/>, [https://files.hawaii.gov/dbedt/economic/data\\_reports/DLIR/LFR\\_CES\\_HES\\_AE.xls](https://files.hawaii.gov/dbedt/economic/data_reports/DLIR/LFR_CES_HES_AE.xls)), BLS (<https://data.bls.gov/cgi-bin/surveymost?r9>); seasonally adjusted), regression of natural log of seasonally-adjusted quarterly Hawaii MSA (Oahu, Maui) average hourly earnings deflated with interpolated Urban Hawaii CPI-U, 2013-2019, projected through 2023.

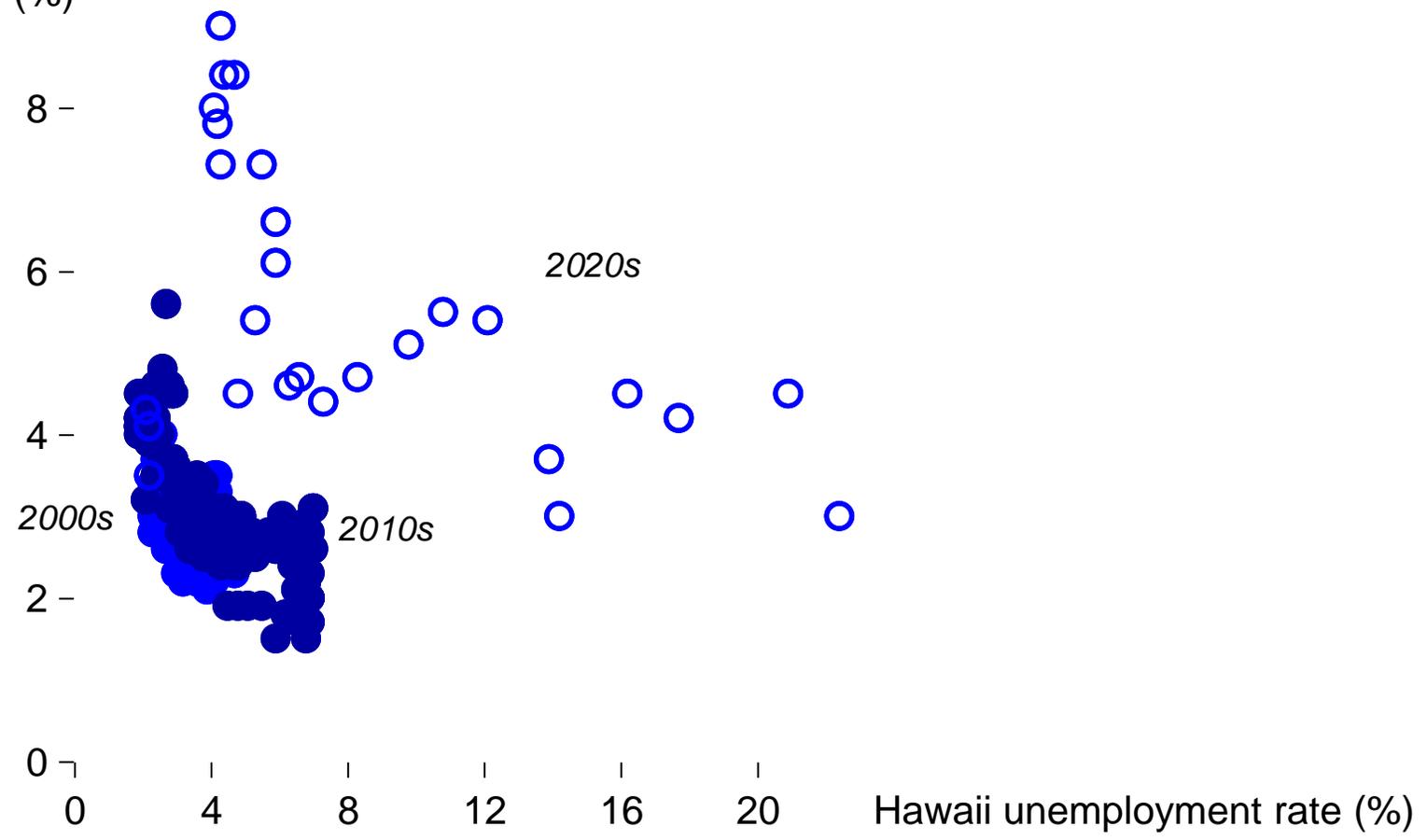
# Alternative measures of Hawaii labor underutilization, 4-quarter trailing through 2022Q1; U-*i*, $i < 3$ , $i > 3$ are uninformative about business cycle

Hawaii unemployment as percent of labor force



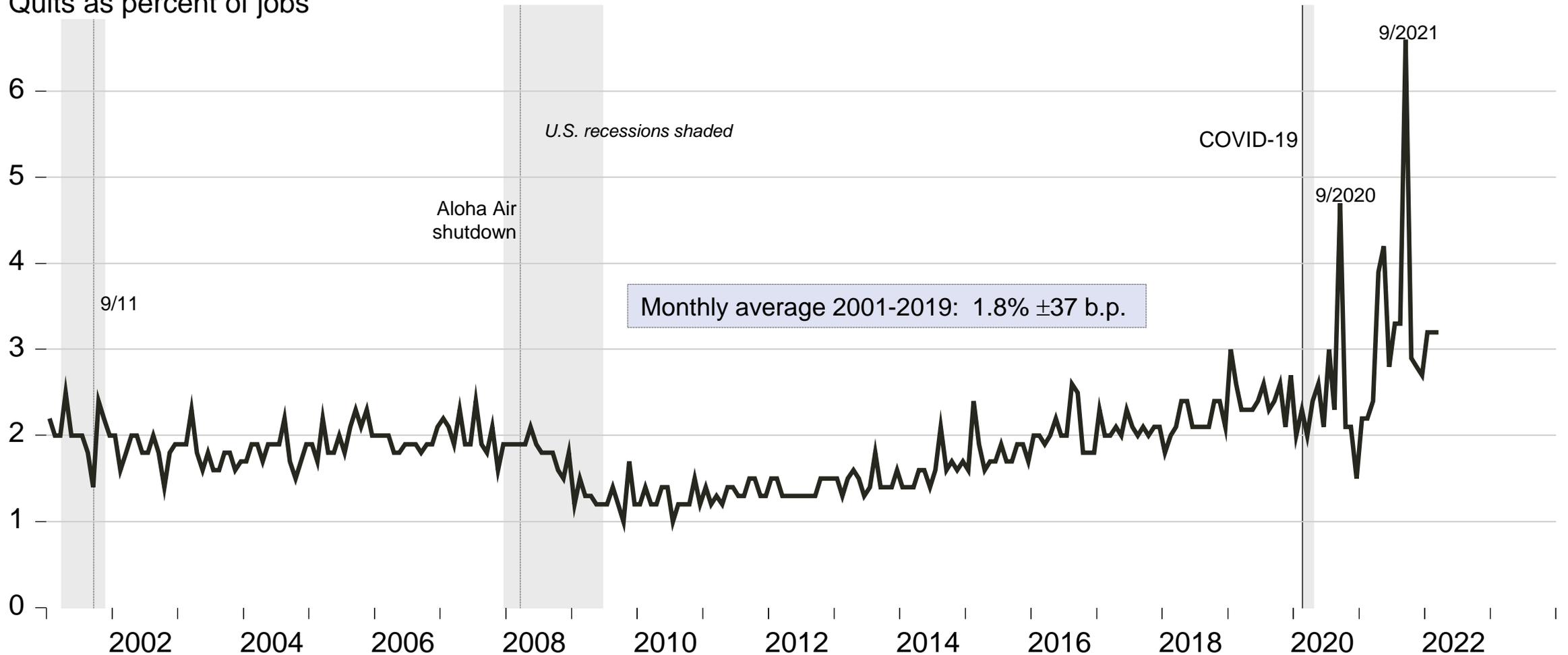
# Hawaii Beveridge Curve: higher unemployment $\leftrightarrow$ fewer jobs open; post-covid even *more* job openings for a given unemployment rate

Hawaii job openings as percent of payroll employment (jobs) (%)



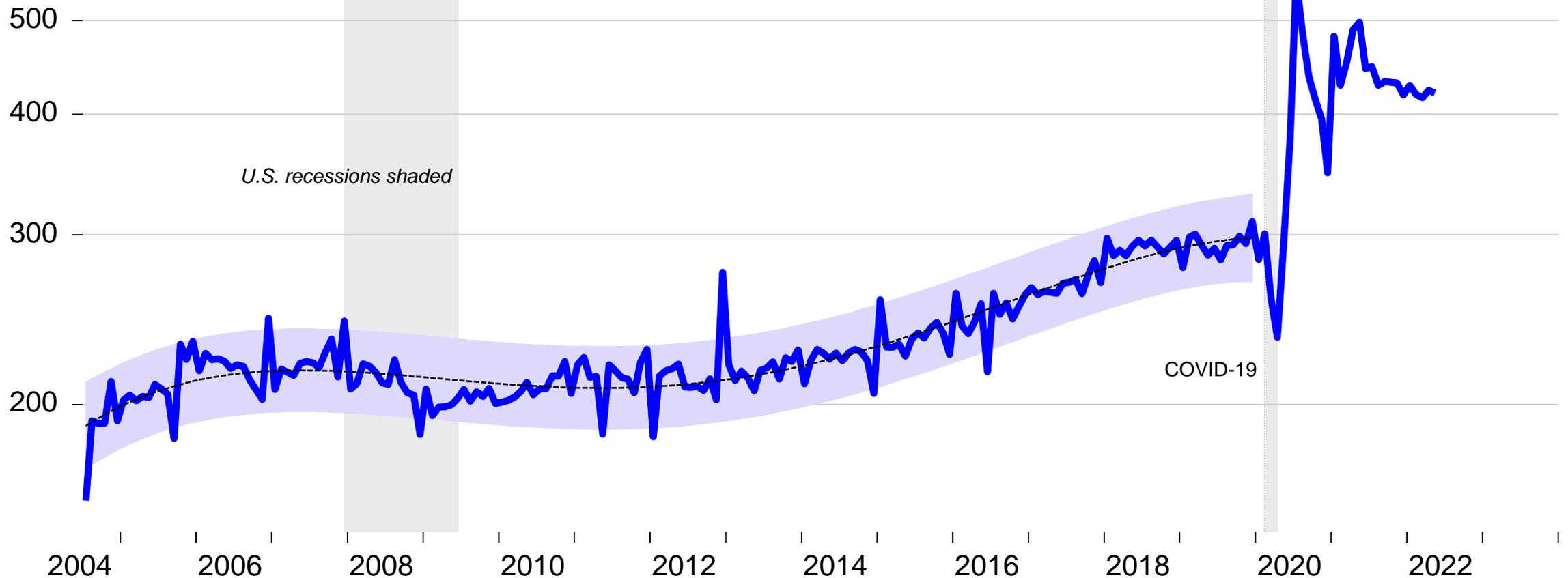
# Hawaii's Great Resignation—voluntarily separations excl. retirements, transfers to other locations—note “Back to School” challenges

Quits as percent of jobs



# After they quit? Census Bureau national business registration data show leap, oscillatory convergence in new enterprise-formation

Monthly applications for federal Employer Identification Numbers\* (EIN), thousands, s.a. (logs)



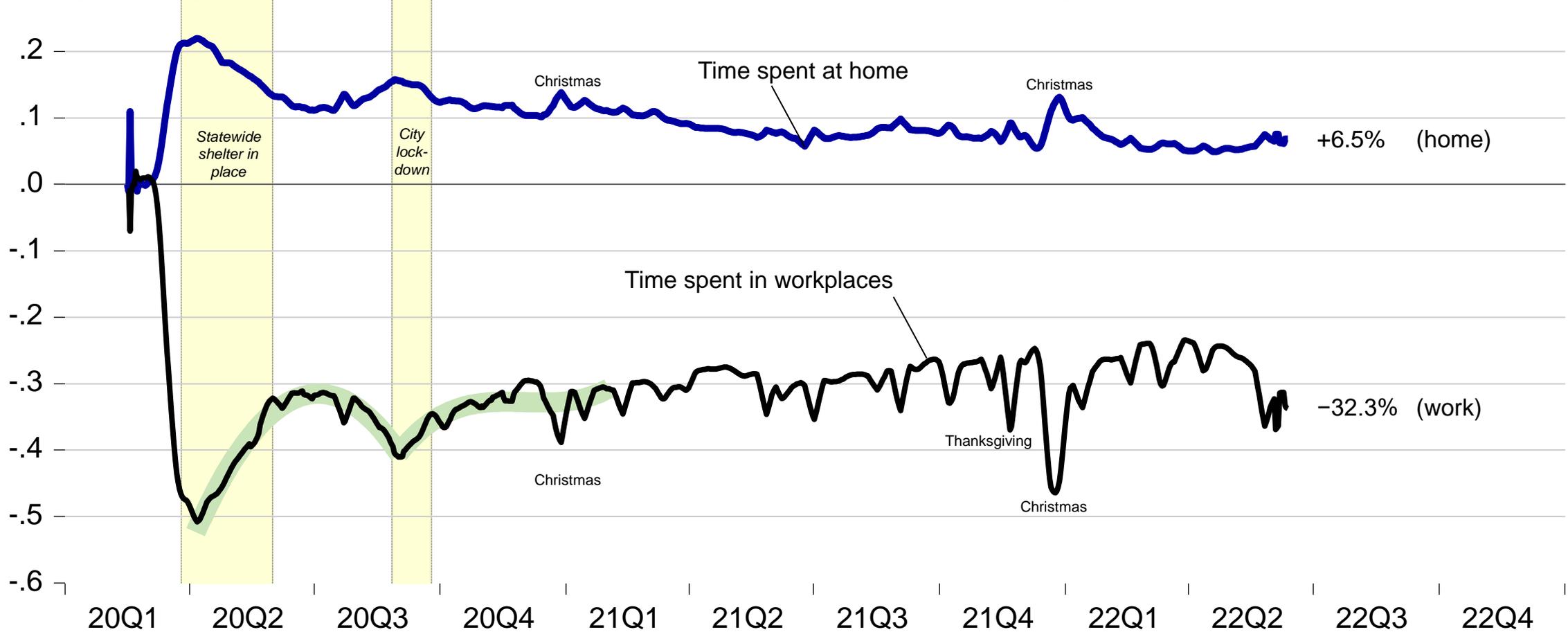
\*Applications for an EIN, except for applications for tax liens, estates, trusts, certain financial filings, applications outside of the 50 states and DC or with no state-county geocodes, applications with certain NAICS codes in sector 11 (agriculture, forestry, fishing and hunting) or 92 (public administration) that have low transition rates, and applications in certain industries (e.g. private households, civic and social organizations)

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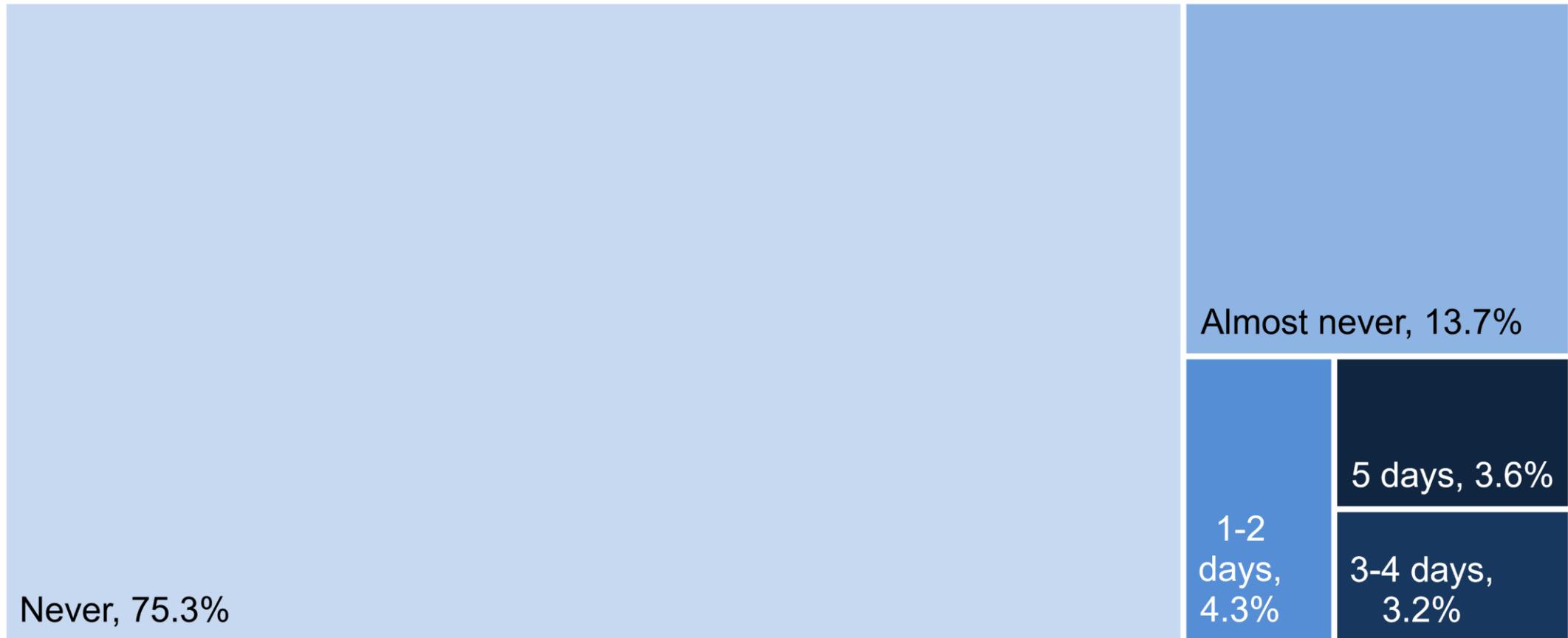
Sources: U.S. Census Bureau, Business Applications for All NAICS in the U.S., retrieved from FRED, Federal Reserve Bank of St. Louis (<https://fred.stlouisfed.org/series/BABATOTALSAUS>); monthly data through May 2022, fourth-order polynomial trend regression depicted with 2 standard-error bandwidth

# Resident behavior changes in anonymized Hawaii mobility data: more time at home, less time in traditional workplaces—2022Q2 fade-out

Google smartphone GPS mobility indexes for Hawaii residents relative to January 2020

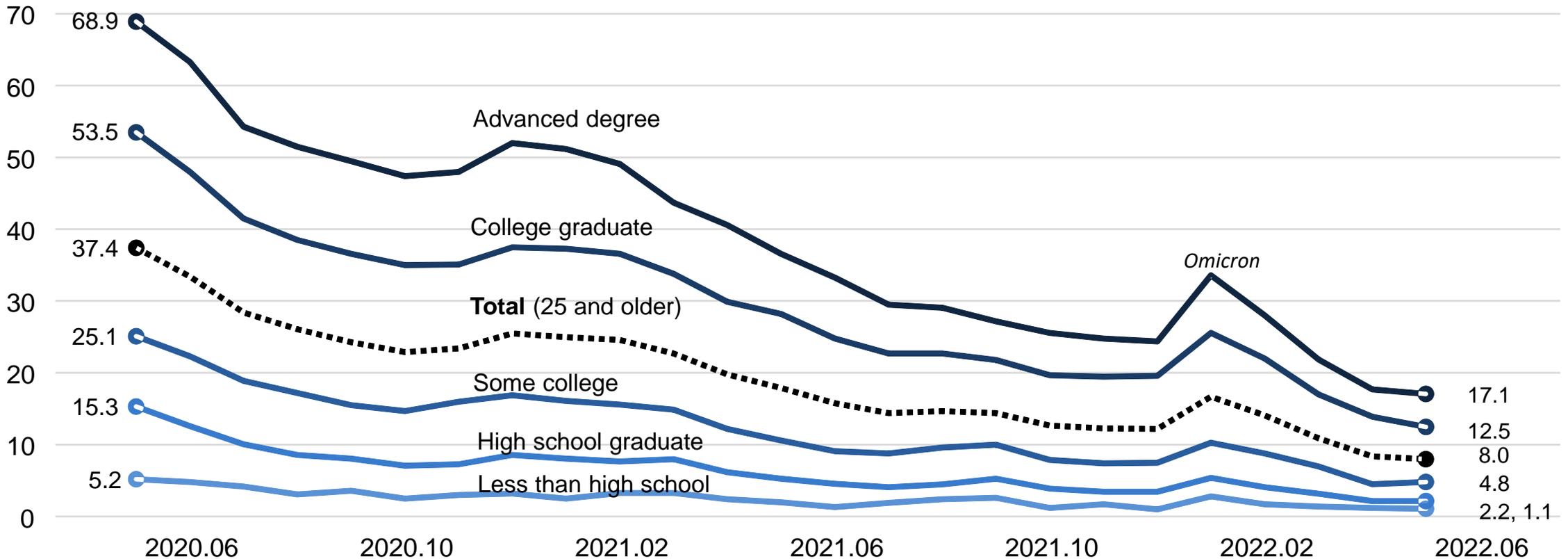


# Pre-covid distribution of U.S. workers who worked at home and how often they worked exclusively by selected characteristics, 2017-2018



# U.S. workers who teleworked or worked at home for pay specifically because of COVID-19, excluding those who did pre-pandemic\* (BLS)

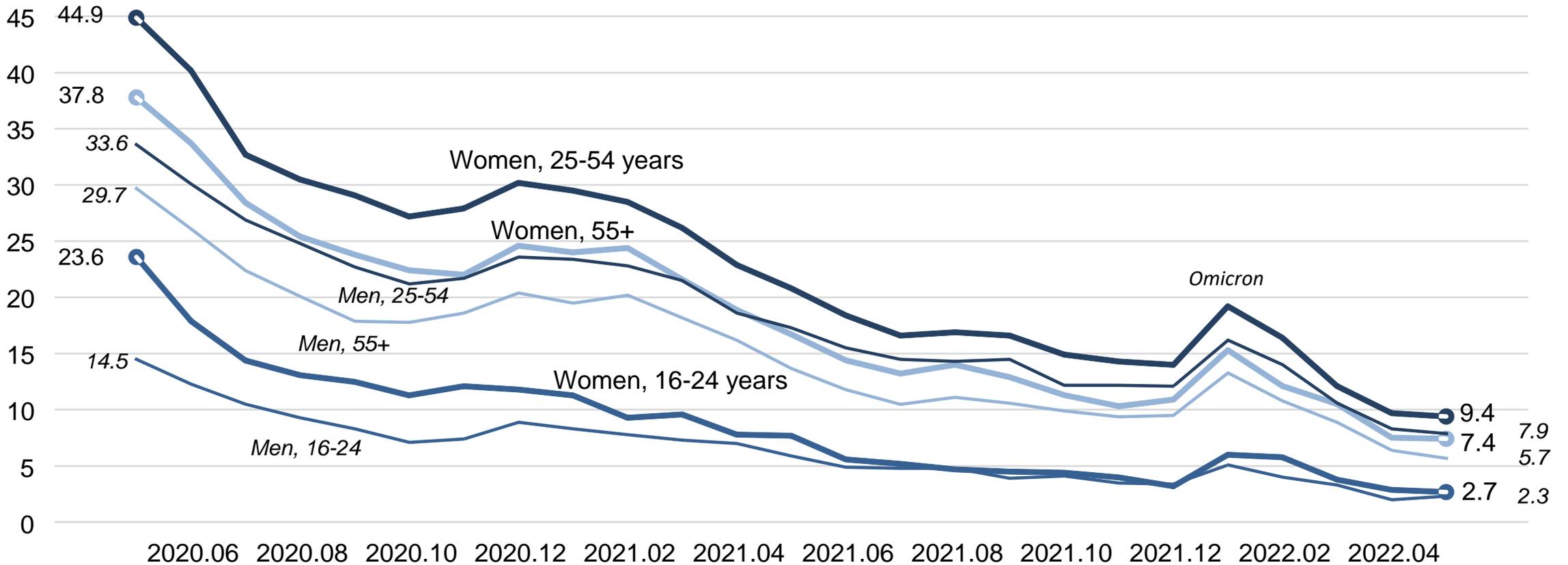
Percent of U.S. workers who teleworked because of COVID-19



\*Or those whose telework was unrelated to the pandemic.

# U.S. workers who teleworked or worked at home for pay specifically because of COVID-19, excluding those who did pre-pandemic\* (BLS)

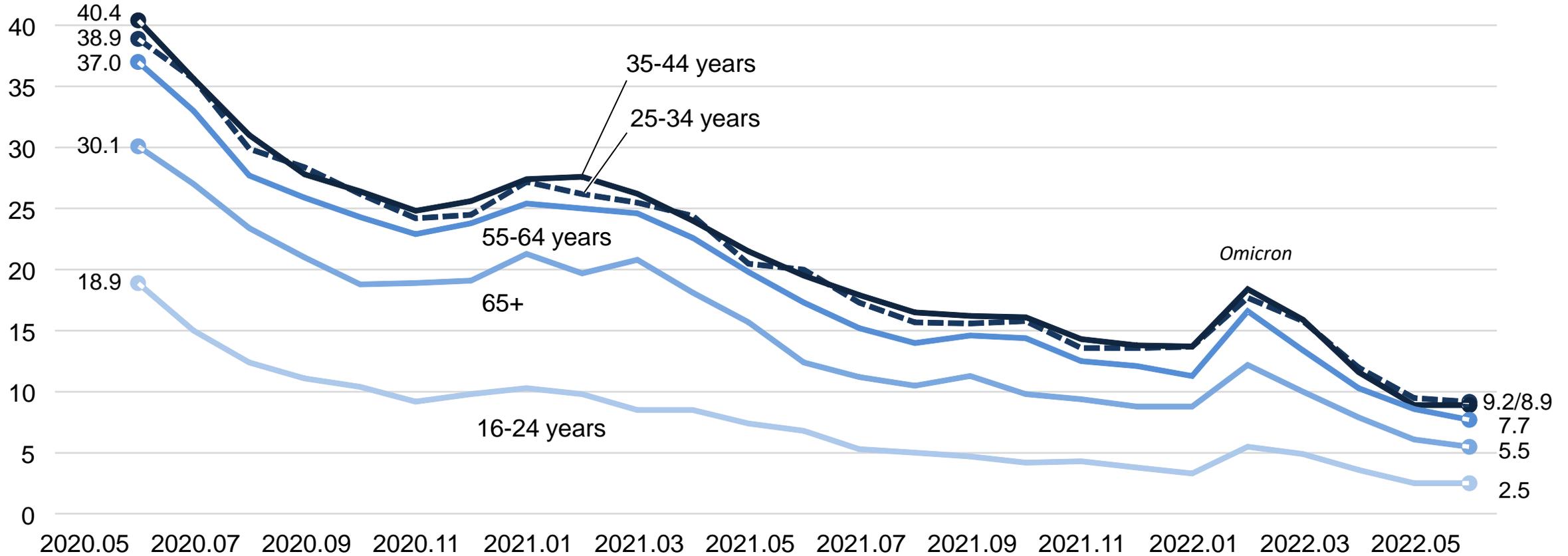
Percent of U.S. workers who teleworked because of COVID-19 by gender



\*Or those whose telework was unrelated to the pandemic.

# U.S. workers who teleworked or worked at home for pay specifically because of COVID-19, excluding those who did pre-pandemic\* (BLS)

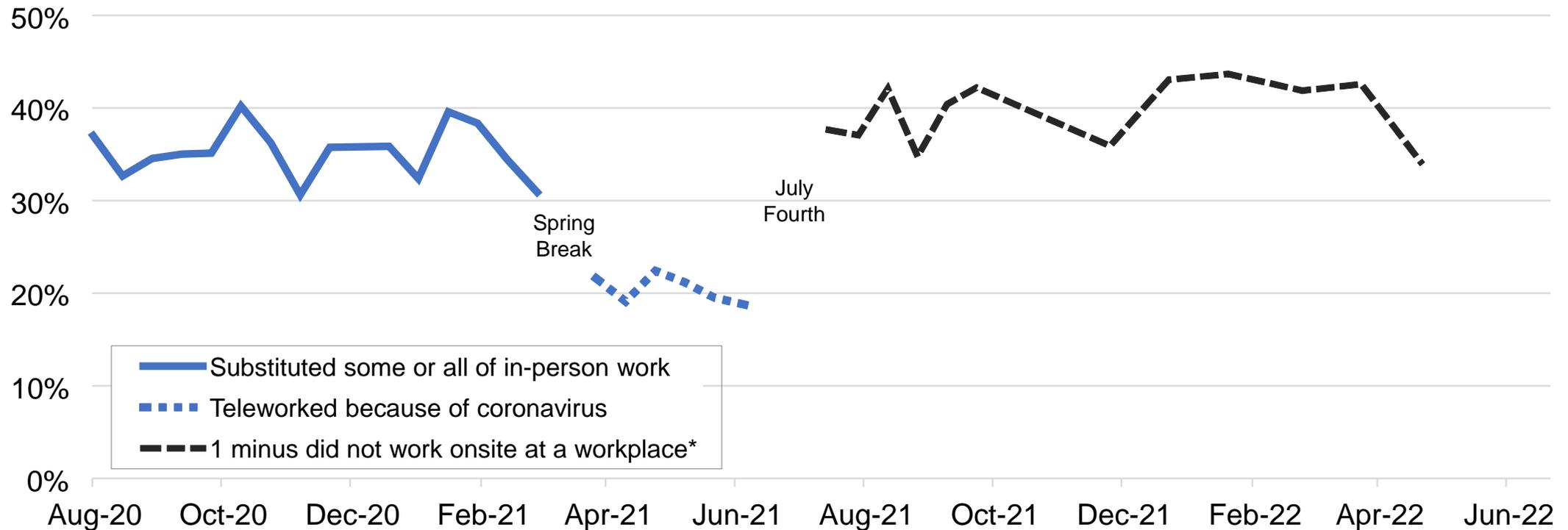
Percent of workers by age cohort



\*Or those whose telework was unrelated to the pandemic.

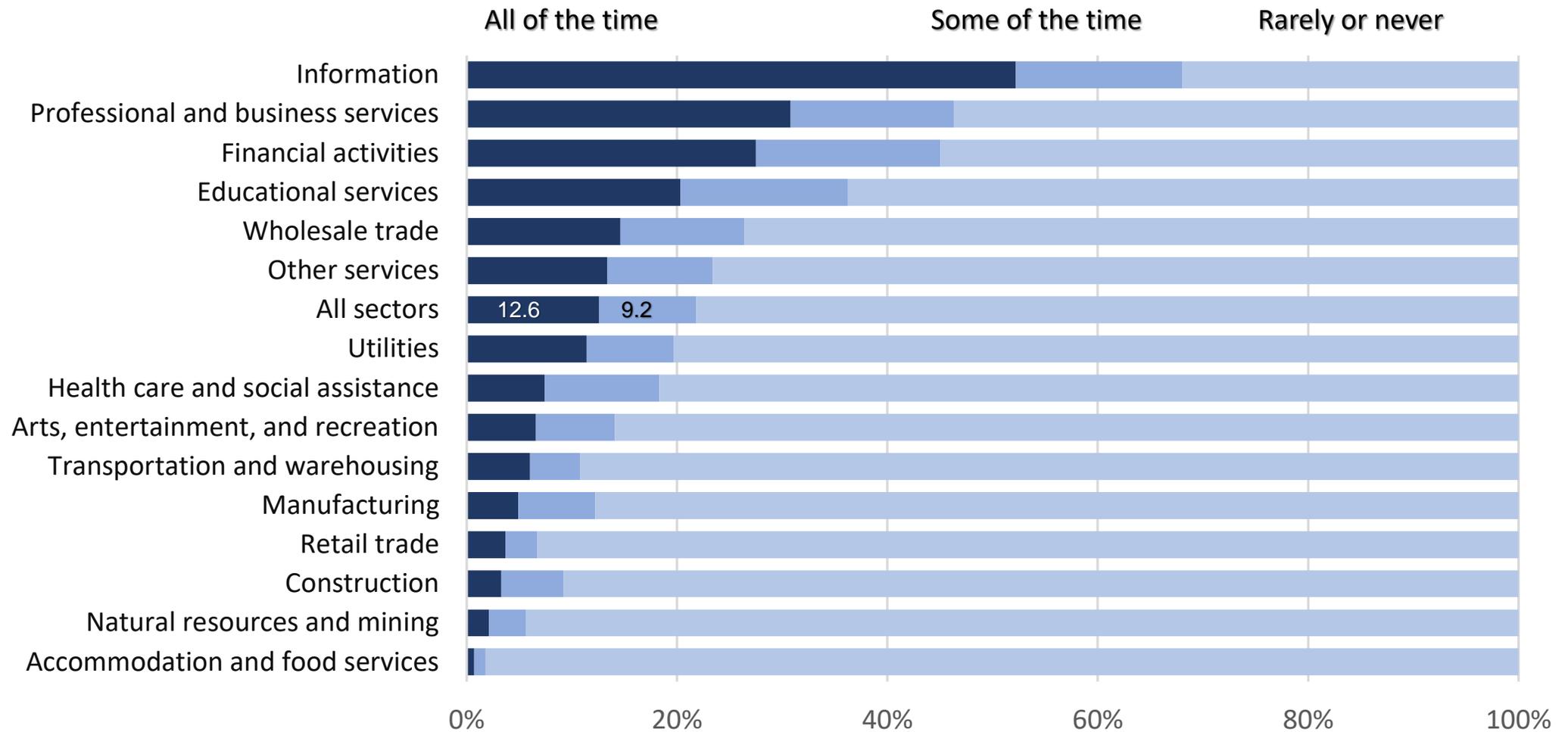
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# Household pulse data\* for Hawaii show that $\geq 1/5$ of respondents live in households in which at least one adult teleworked because of Covid

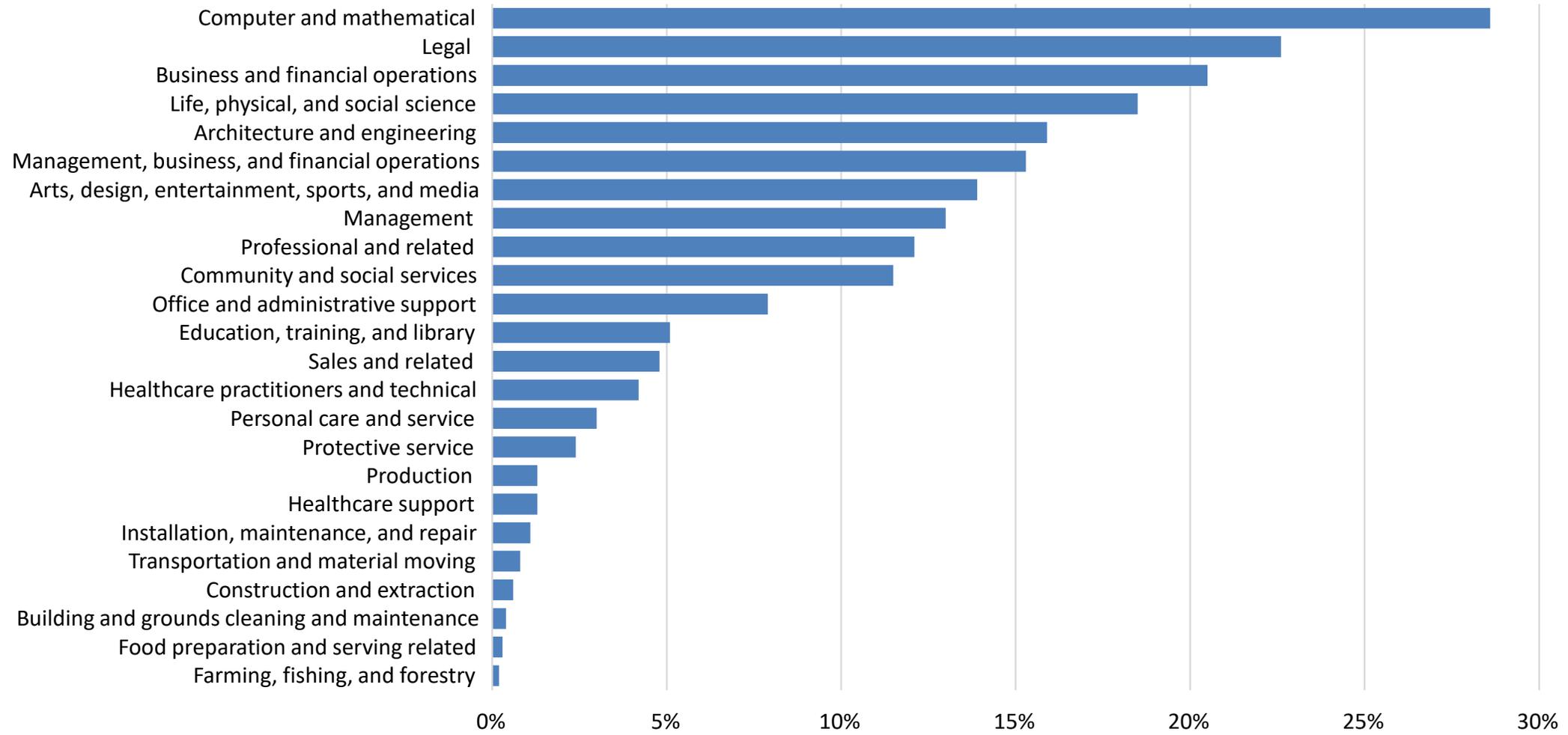


\* Surveys before April 2021 define “Percentage of adults living in households where at least one adult has substituted some or all of their typical in-person work for telework because of the coronavirus pandemic,” from April-June 2021 “Percentage of adults living in households where at least one adult has teleworked because of the coronavirus pandemic in the last 7 days,” and beginning in July 2021, “Percentage of adults in households where someone worked onsite at a workplace in the last 7 days (i.e. 65.8% between April 27 and May 9, 2022);” or one-third *who did not*.

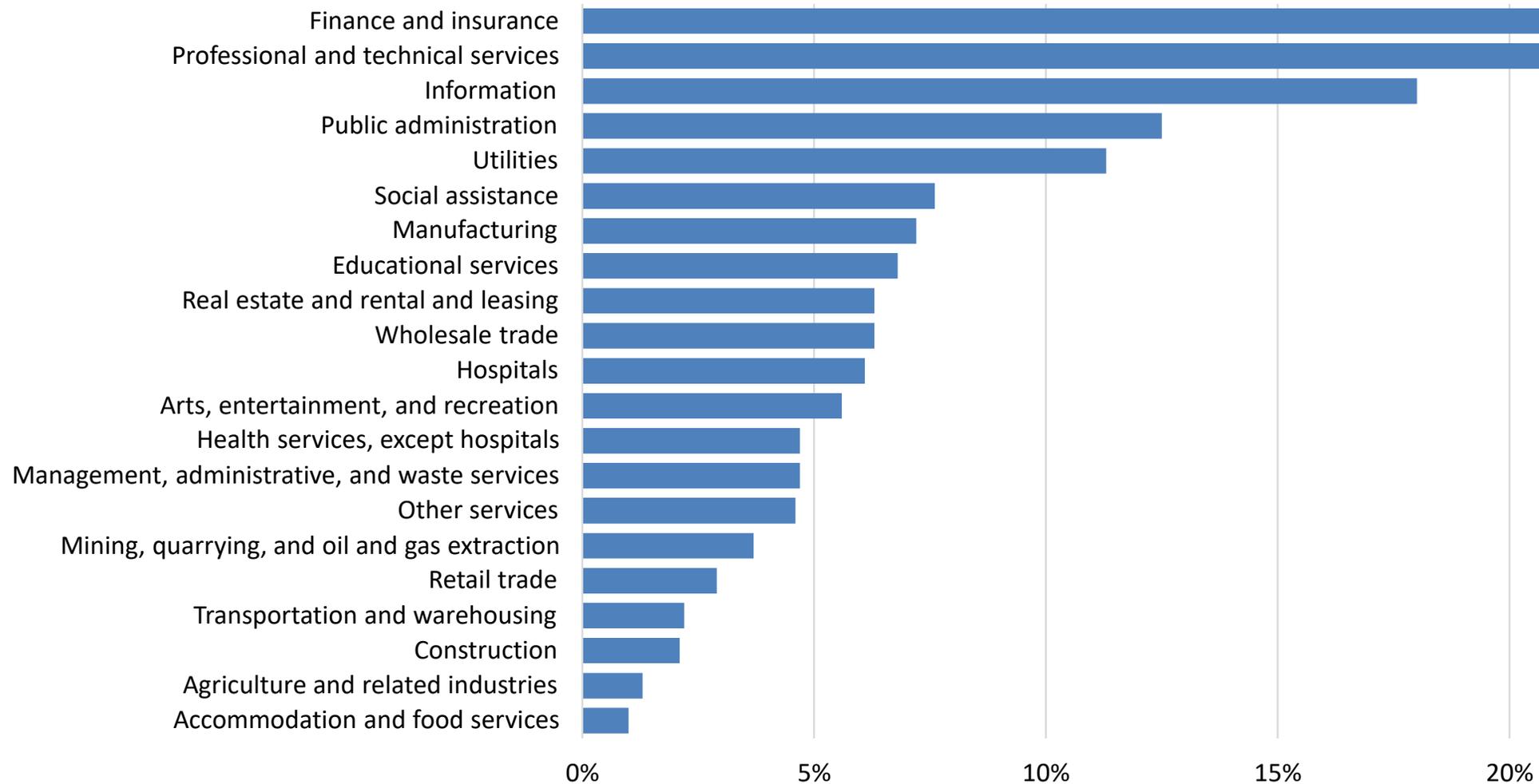
# Results of the BLS 2021 Business Response Survey: percent of jobs that involved teleworking in 2021 because of the coronavirus pandemic



# U.S. employed persons who teleworked by occupation, May 2022; why it “pays” in math, law, finance, science, engineering, etc.

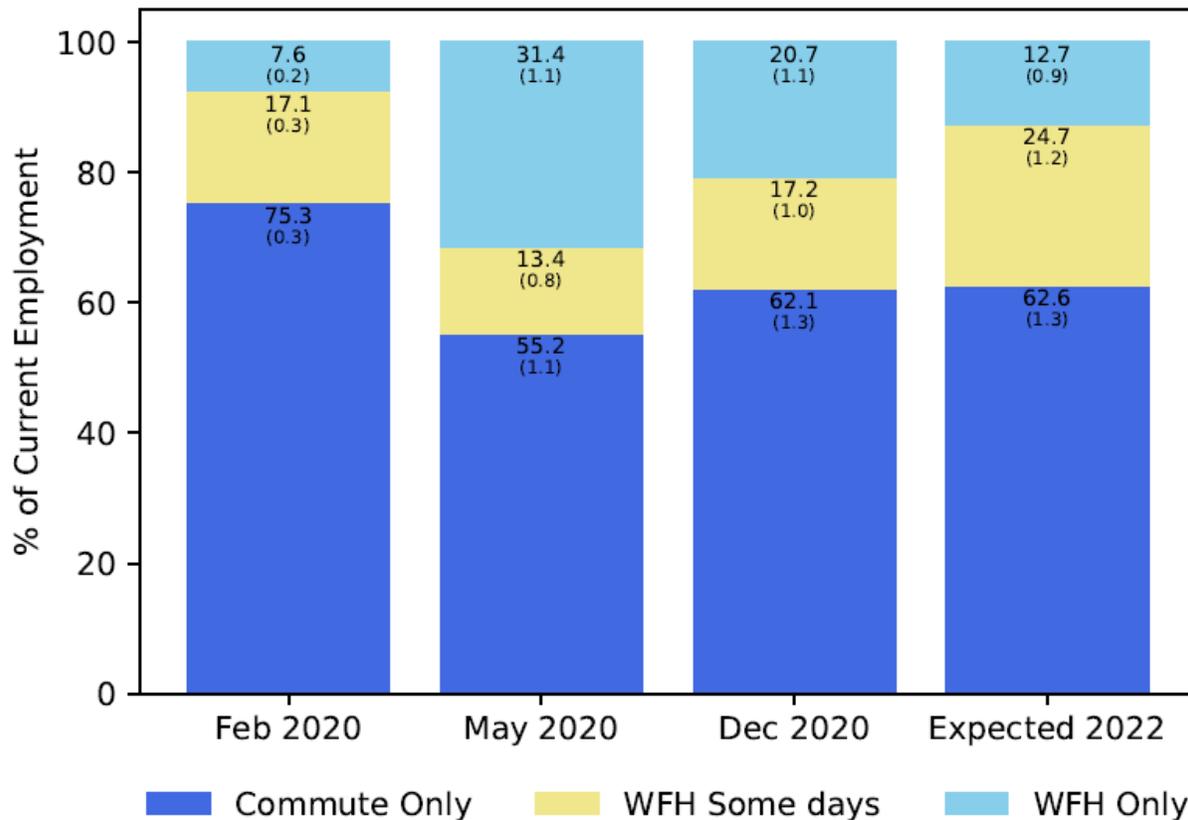


# U.S. employed persons who teleworked by industry, May 2022: financial, professional, technical, information, public sectors

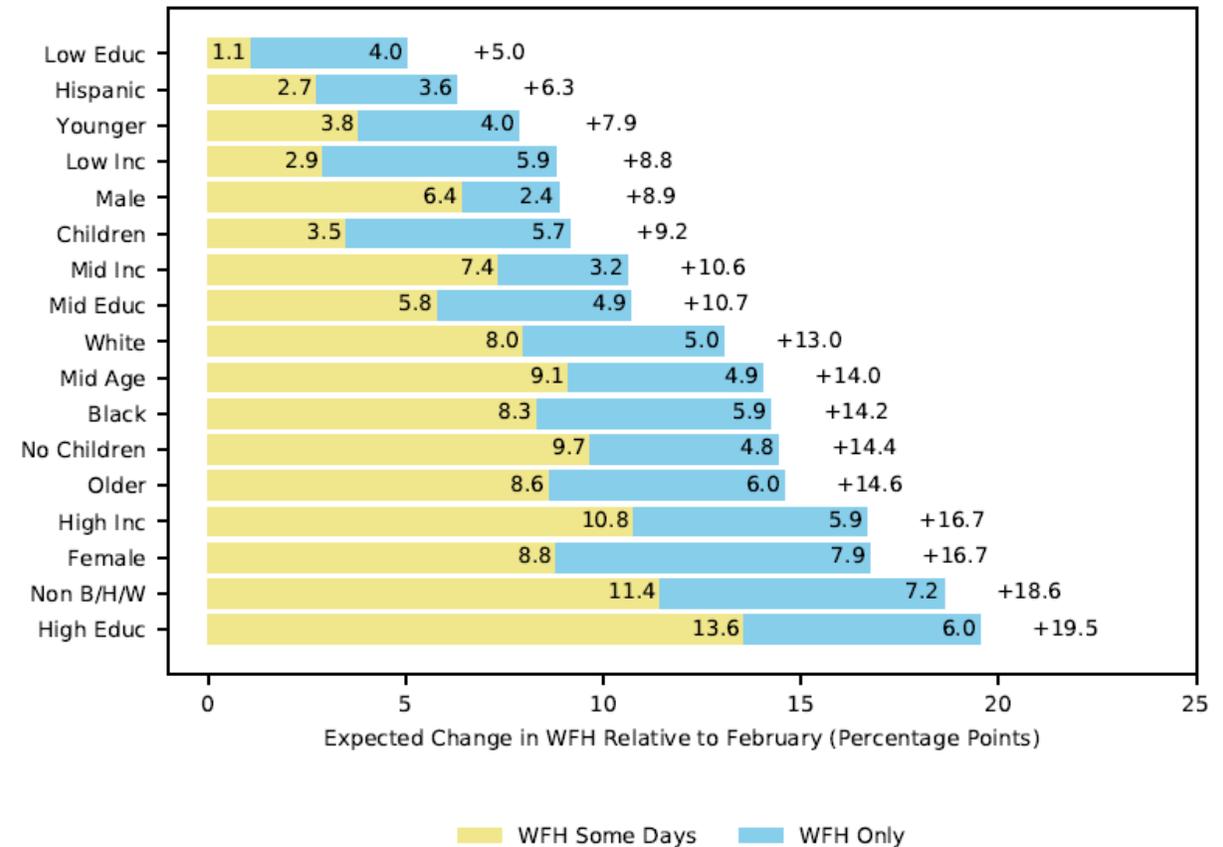


# Expectations for work from home 2022 (FRB Dallas (February 2022)): 63% commute only, 25% hybrid work, 13% work from home only

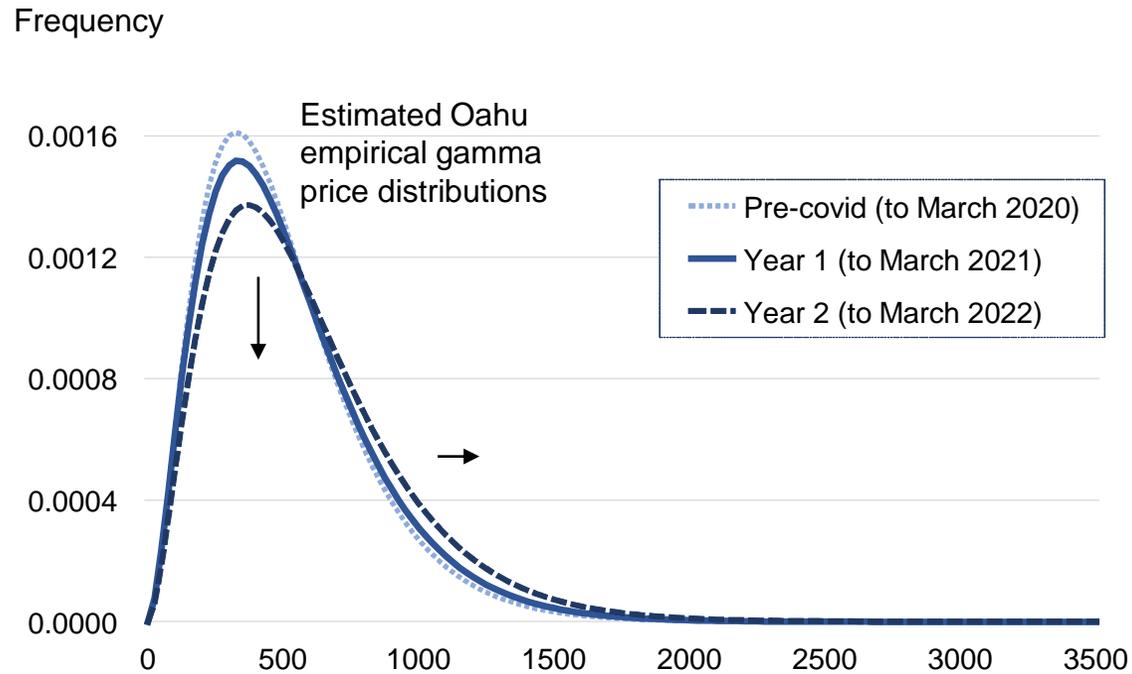
(a) Aggregate



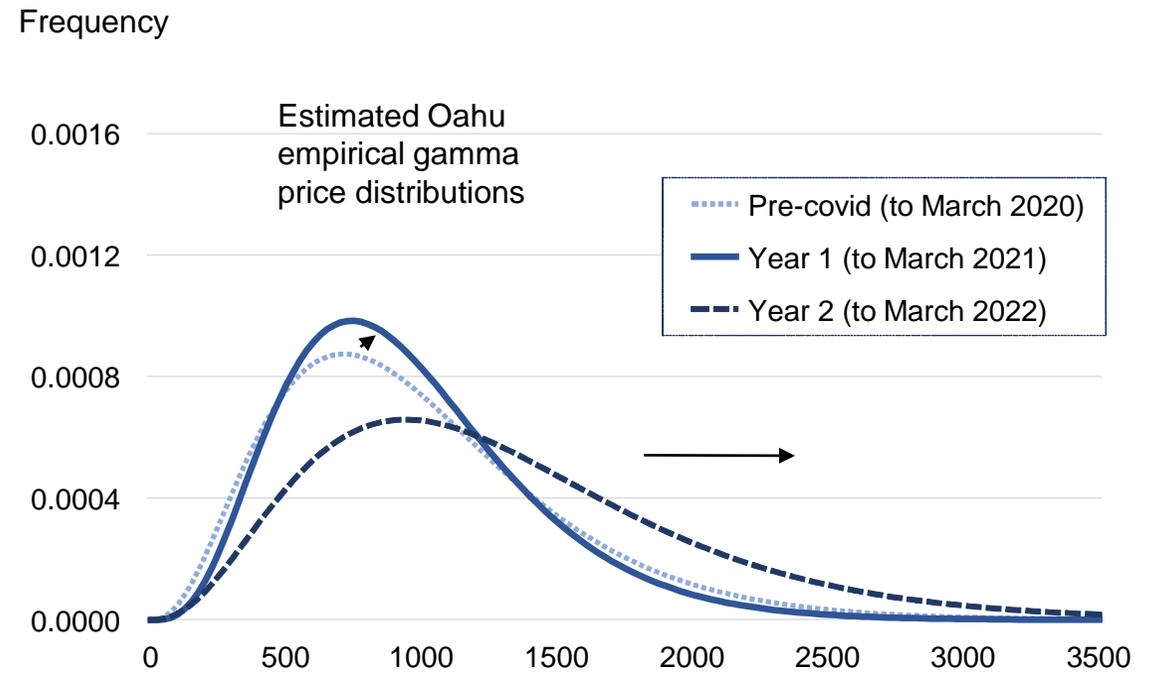
(b) By Demographic Group



# Revised Oahu home price distributions post-Covid: much more substantive move upward in SF prices than condo, post-covid

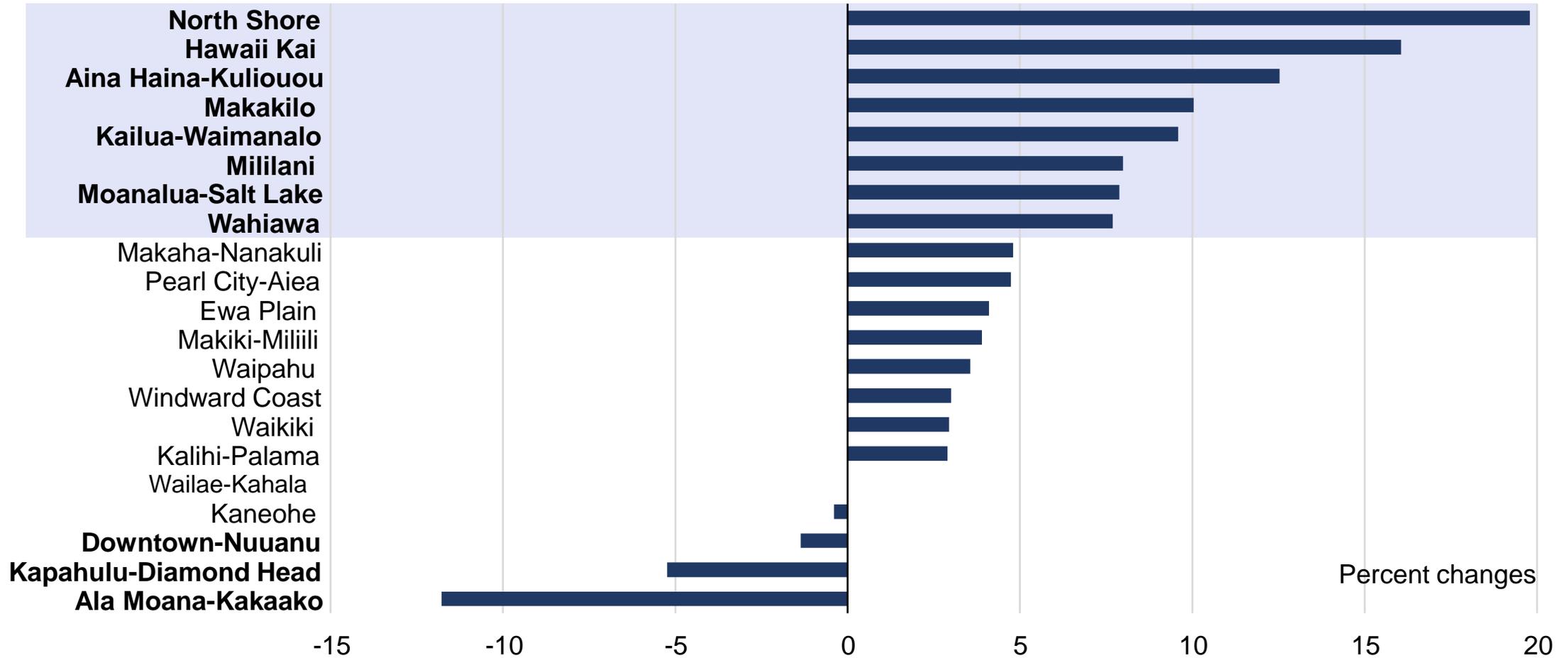


Oahu condominium sales prices



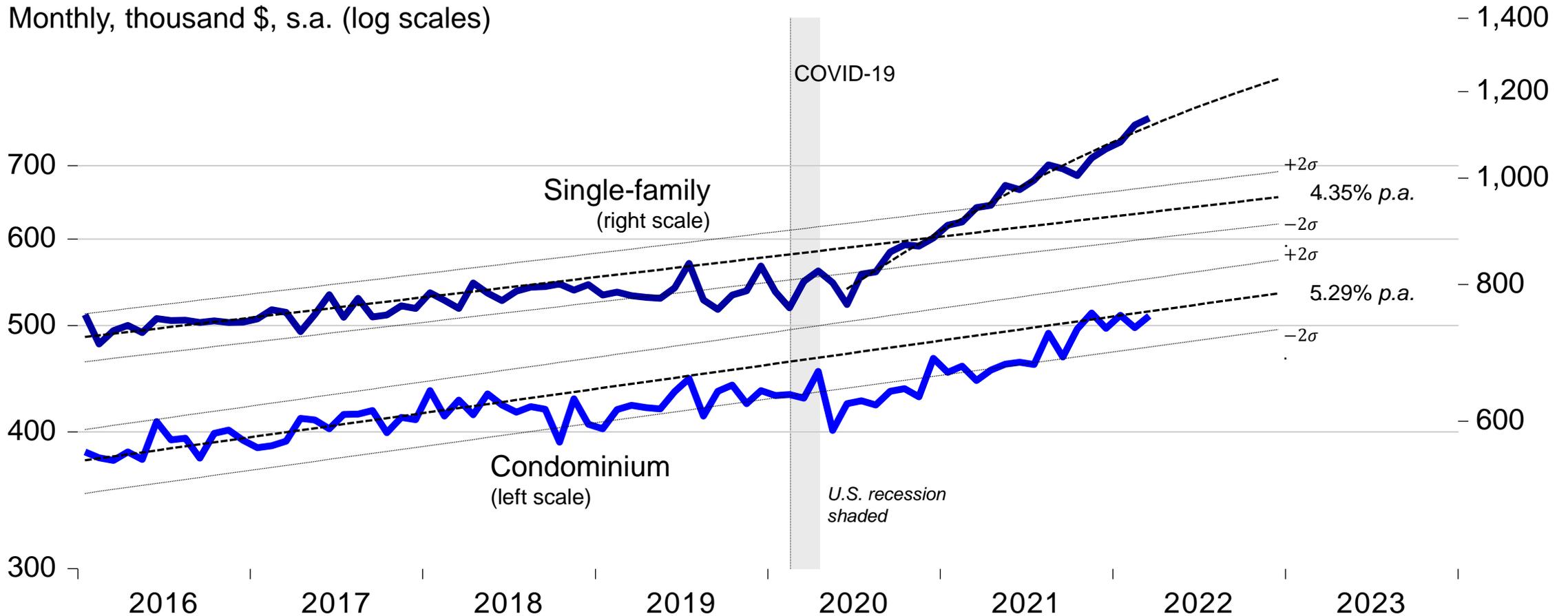
Oahu single-family home sales prices

# Oahu single-family home price appreciation by 'hood in 2020: COVID shift to exurbs, suburbs from urban core—The Donut Effect\*

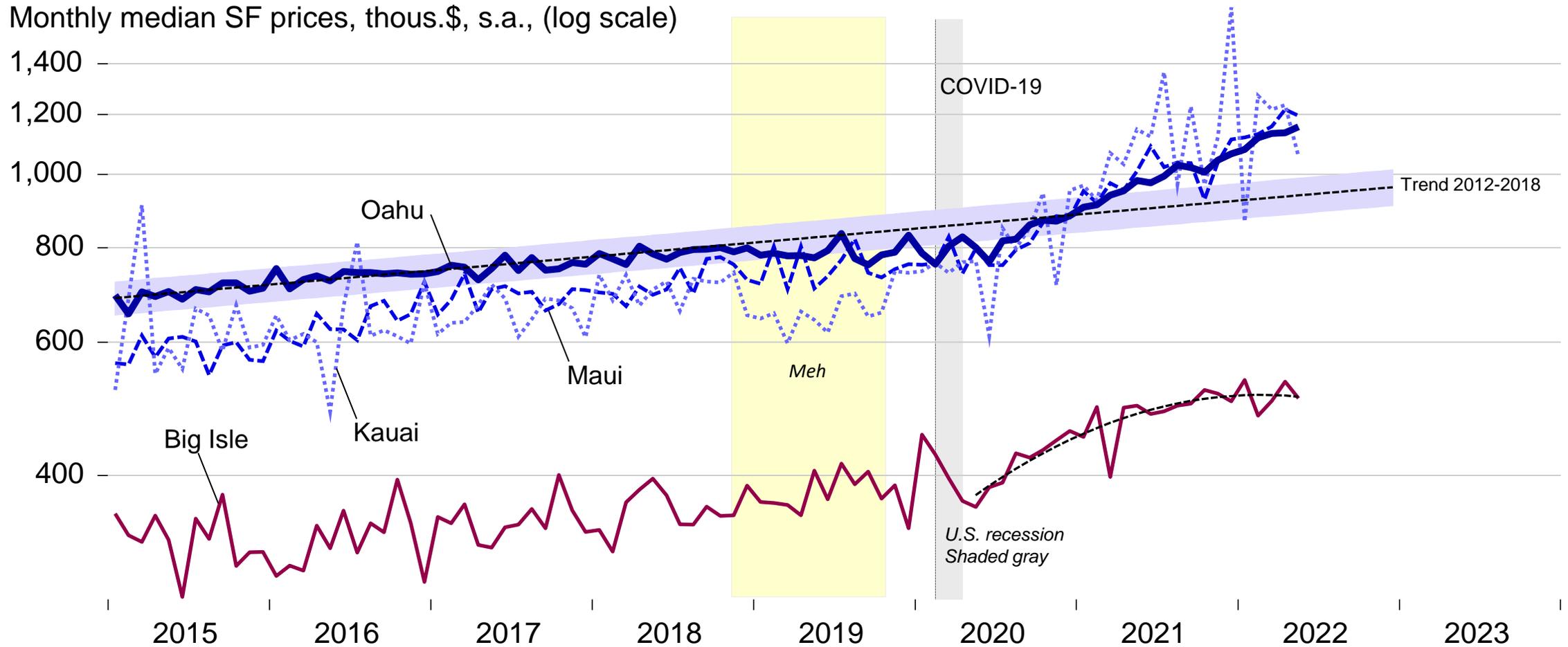


\*Arjun Ramani, Nicholas Bloom (January 2021), "The donut effect: How COVID-19 shapes real estate," *Stanford Institute for Economic Policy Research Policy Brief* (<https://siepr.stanford.edu/research/publications/donut-effect-how-covid-19-shapes-real-estate>)

# Oahu monthly existing SF home median sales prices jumped after the covid recession, not condos, suggesting buyer preference shift



# Bubblicious arc of median single-family prices post-covid (logs) means price deceleration *preceded* recent rise in interest rates



# Comments of BLS Commissioner William Beach on which new data “drove a lot of interest and traffic; what really seemed to take off?”

- “I’m beginning to think that this pandemic...has accelerated structural change in the economy. ...You can sense it in the distributed platform as a way of working—telework. Automation, global value chains had already...wreaked havoc with the workplace but I think the workplace is changing faster today than at any time since the industrial revolution.
- The questions we put out had two sides to them. One side measure the pandemic. ...The other side of that was to take a look at the way that the workplace itself was restructuring. So, we’ve gone from 36 percent at telework in the payroll employment to about 14 percent and it’s leveling off. Well, if it stays at 14 percent that’s a very serious, high percentage.
- We did surveys on workplace safety, on sick leave, all of that’s changing too as the workplace changes. So, I think the research question coming out of this at least for the Labor Department will be to say:
  - How has the structure of the workplace changed?
  - How has the structure of labor relations changed?because of the pandemic.
- We’re not going to go back to normal because the changes already are noticeably permanent in certain areas. That’s what our surveys...are beginning to shed light on this, I don’t what to call it, maybe it’s The New Economy. And on this point 86 percent now of payroll employment is in the services-providing sector...and that really accelerated in the last five years. So, that’s another indication that we’ve got some permanent changes going on.”

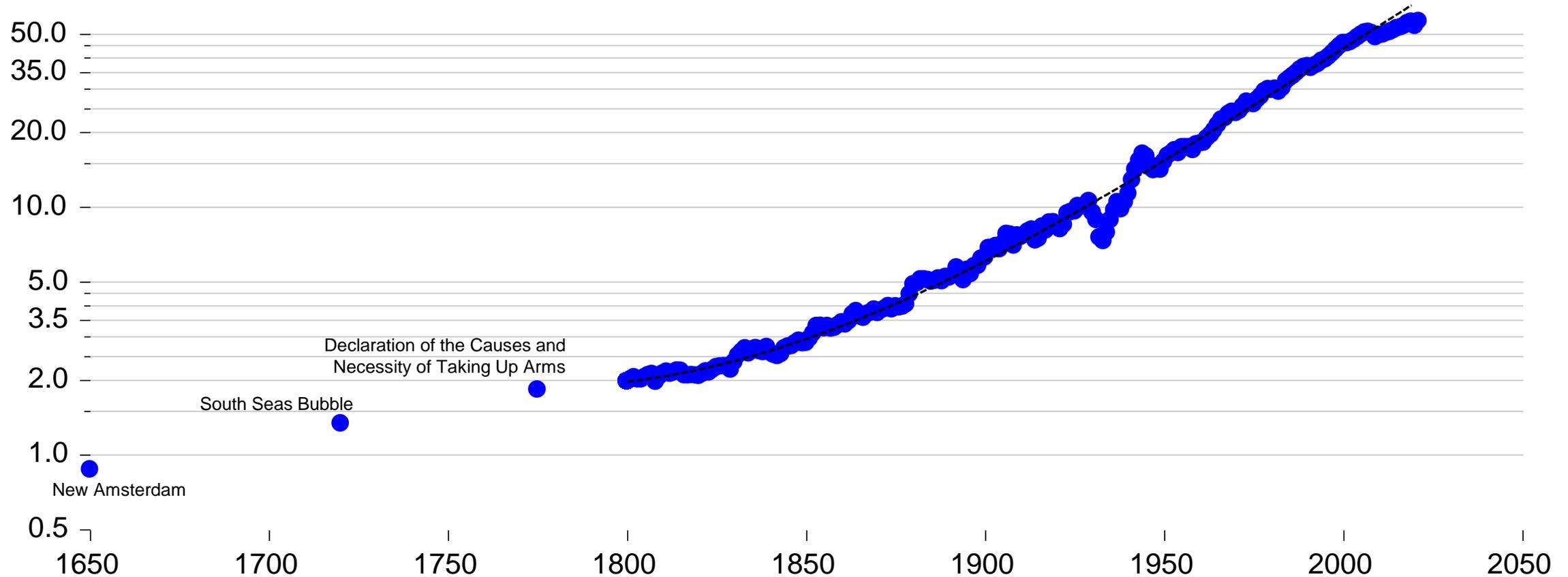


# Macroeconomic data: jobs, real GDP, arrivals—“the 90% problem”

- Everything in Hawaii’s economy is about “90 percent” of pre-covid (2019)
  - Arriving passenger volumes (90 percent of 2019 through June 20, 2022)
  - Jobs (93 percent)
  - Real Hawaii GDP (95 percent)
- Problem: that means everything is about 90-95 percent of 2017, *five* years ago—nobody will talk about Hawaii’s 2018-2019 recession (huh?) (heads in the sand)
- Hawaii real GDP is 15 percentage points below the trend through mid-2017 (it would take double the entirety of tourism exports (value-added), pre-covid, to return to trend)
- Meanwhile: did the next U.S. recession already start? Because the growth recession sure did (first half 2022 U.S. real GDP growth may have been non-positive)
- Either way: all the risk is to the downside, and the next covid variant is gearing up

# Real U.S. GDP per capita since Dutch established New Amsterdam: after Industrial Revolution per capita output grew at 2 percent *p.a.*

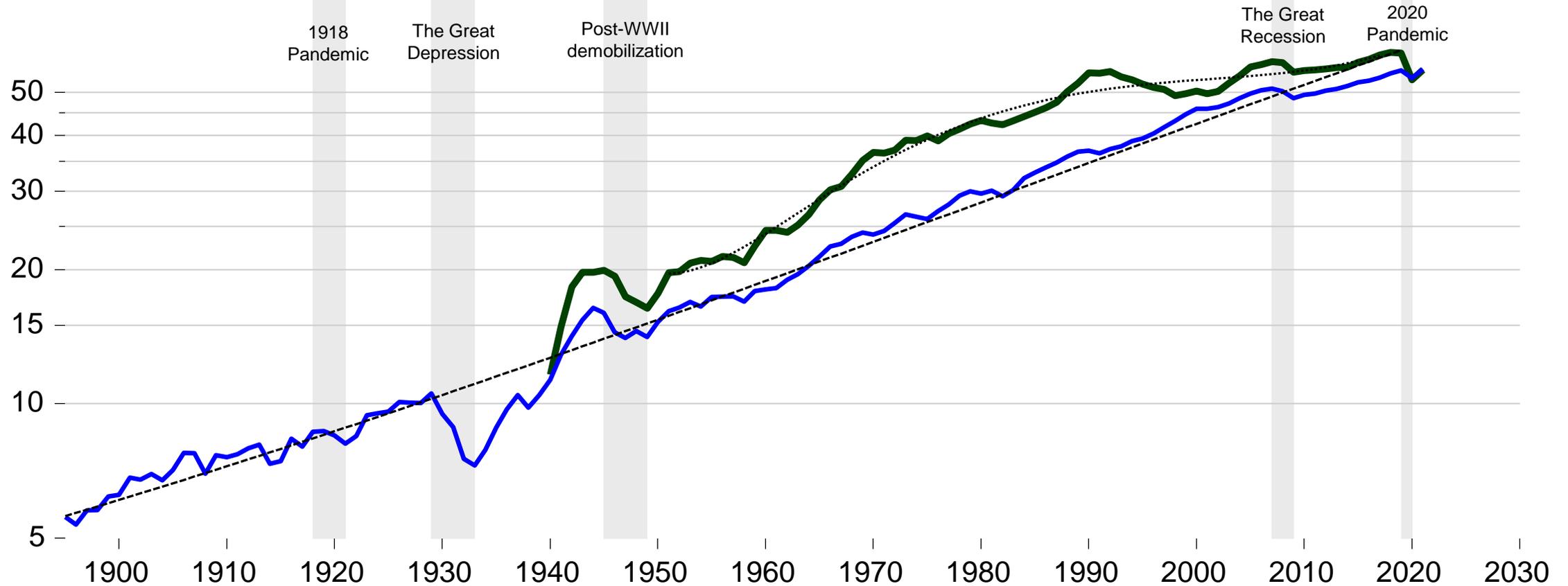
Thousand constant 2011 dollars



Slide copyright 2022 TZE ECONOMIC HISTORY

# During the post-WWII era, after demobilization, Hawaii an “Emerging Market” economy with above-U.S. per capita real output growth

Thousand constant 2011 dollars

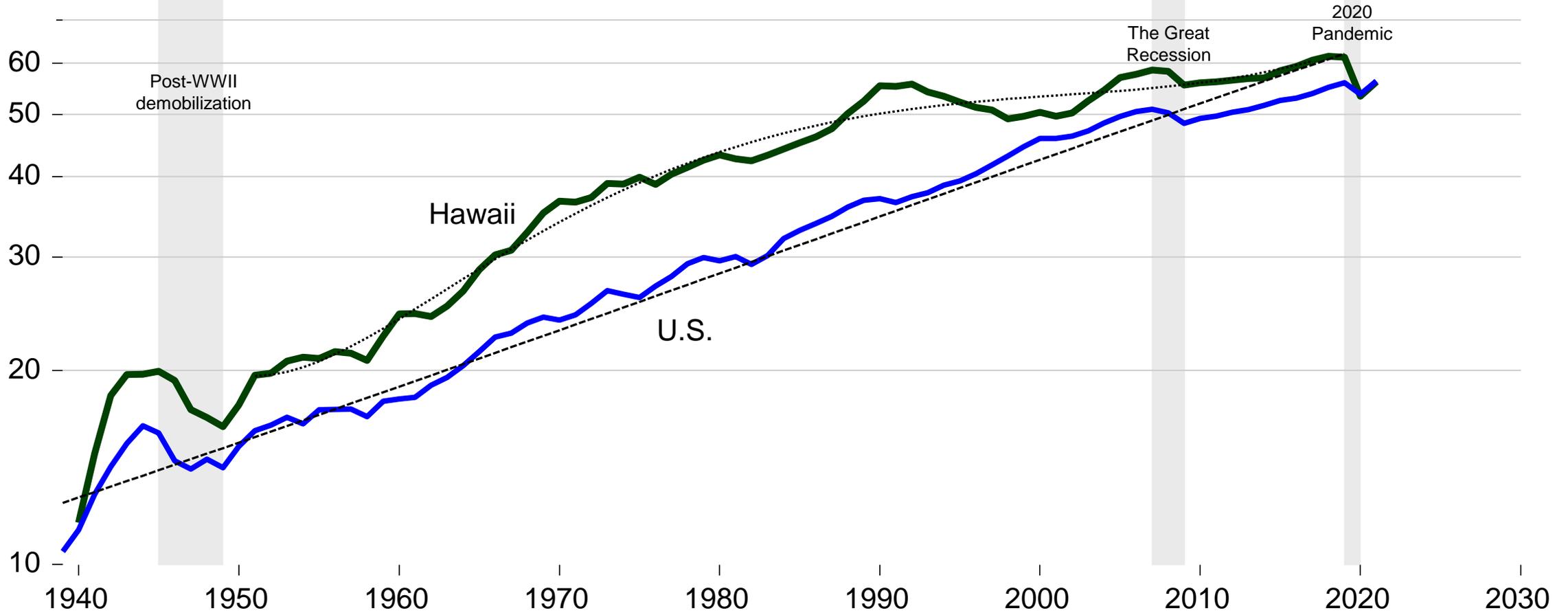


Slide copyright 2022 TZ E C VO N O M T C S

Sources: As in previous slide, plus Robert C. Schmitt, Table 6.1 (1976) *Historical Statistics of Hawaii*, based on UH Economic Research Center work by Harry Oshima, Mitsuo Ono, Bank of Hawaii (unpublished), Yung Shang, William Albrecht, Glenn Ifuku, Hawaii DPED (1988) *Hawaii's Income and Expenditure Accounts*, U.S. BEA (<https://www.bea.gov/data/gdp/gdp-state>), smooth-pasting estimates from constant (chained) dollars from SIC data 1977-1997 through NAICS data 1997-2018 by TZE.

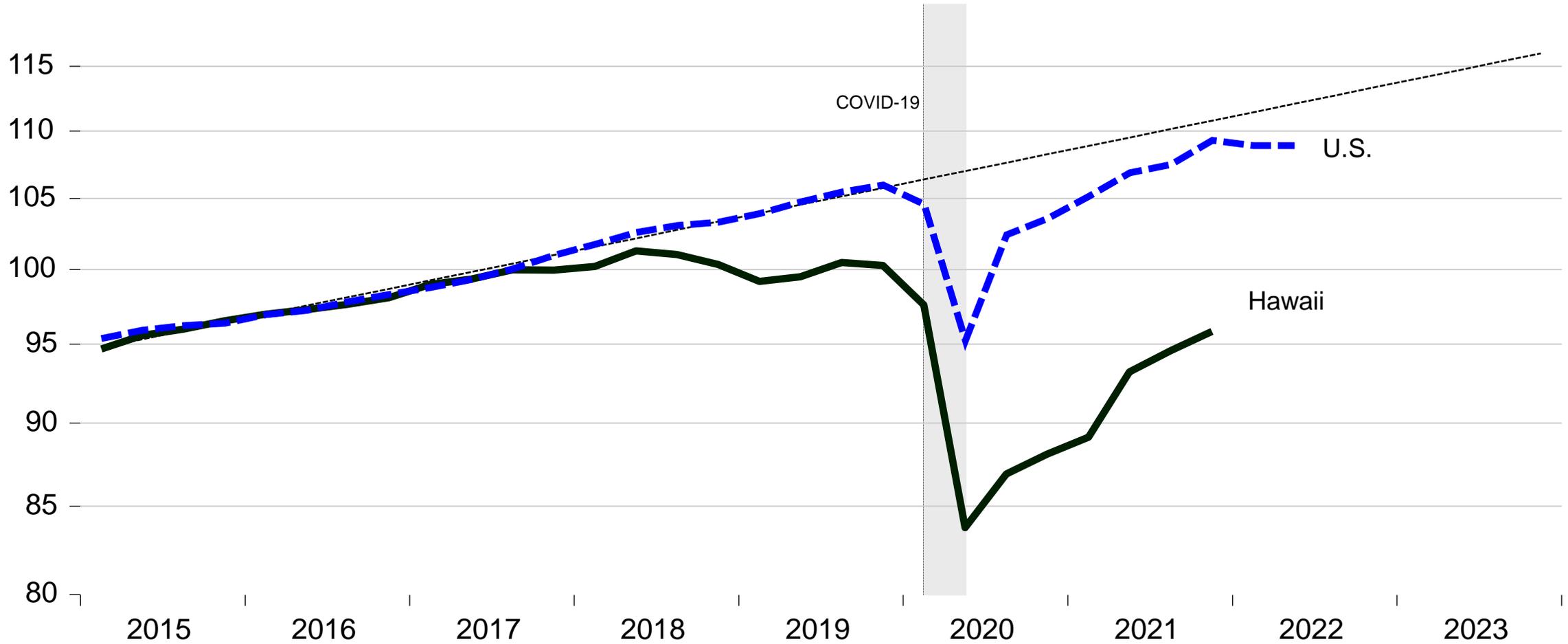
# Superlative Hawaii economic growth throttled after 1970s by zoning and regulation; and now—post-pandemic—by deindustrialization

Thousand constant 2011 dollars



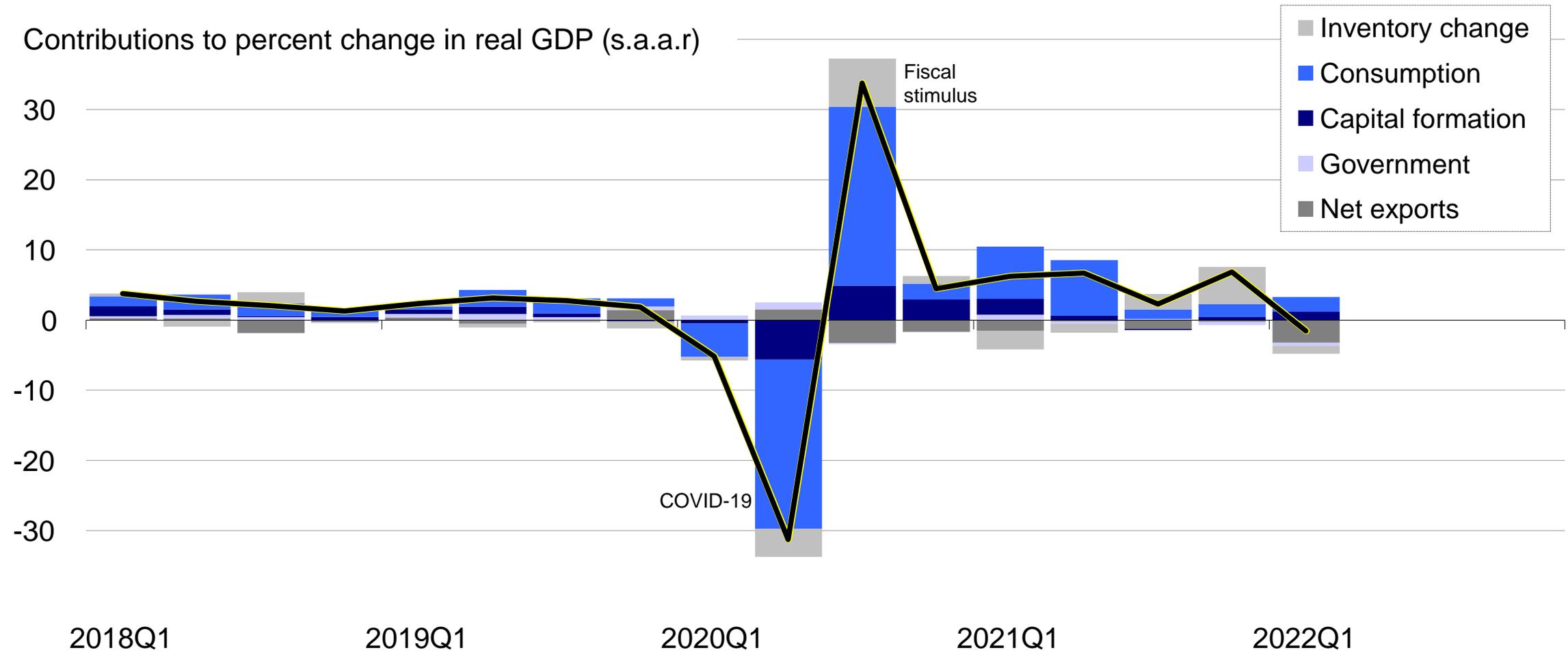
# Ignoring its own recession in 2018-2019, Hawaii real GDP at end-2021 was 15 percent lower than its pre-covid trend (through mid-2017)

Real GDP indexed to third quarter 2017 = 199 (log scale)



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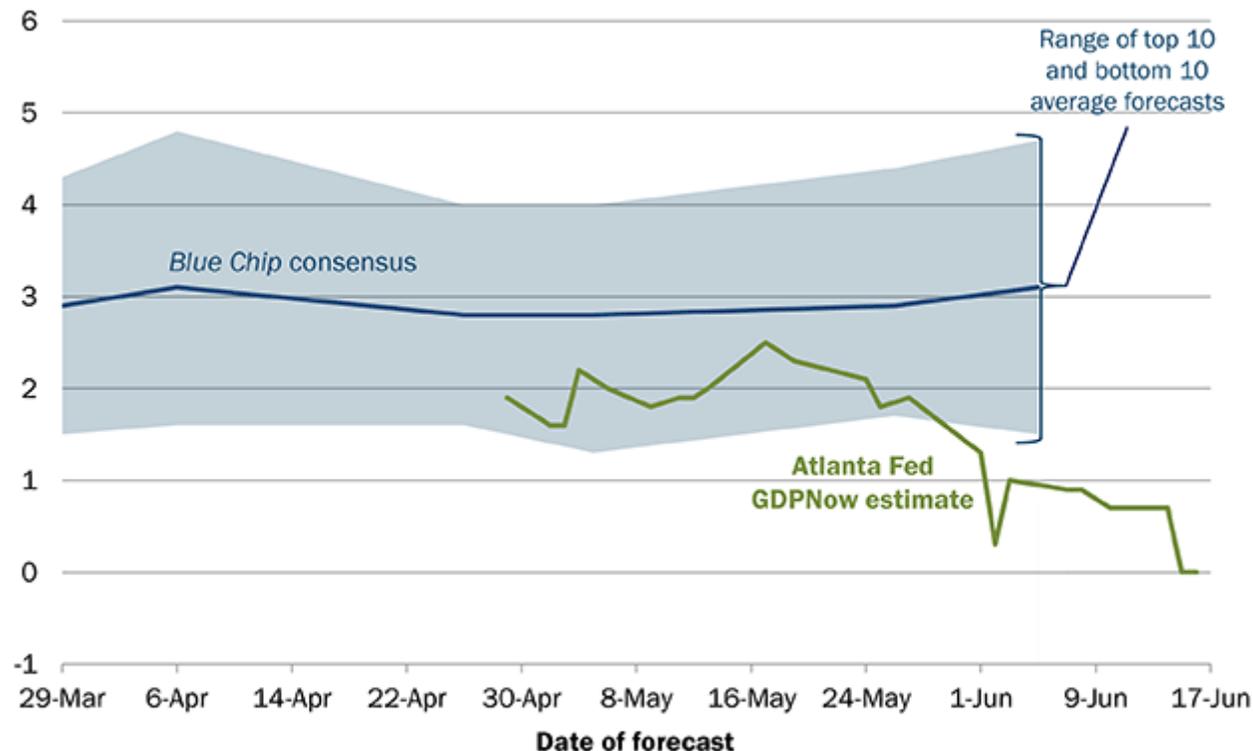
# First quarter real U.S. GDP growth was *minus* 1.5 percent as net exports fell; even stronger dollar in 2022Q2, fading consumption



# High-frequency Nowcasting estimates of U.S. real GDP growth in second quarter 2022 began slipping away from 2% after mid-May

## Evolution of Atlanta Fed GDPNow real GDP estimate for 2022: Q2

Quarterly percent change (SAAR)



Sources: Blue Chip Economic Indicators and Blue Chip Financial Forecasts

Note: The top (bottom) 10 average forecast is an average of the highest (lowest) 10 forecasts in the Blue Chip survey.

Daily estimate: **0.0 percent** — June 16, 2022

The GDPNow model estimate for real GDP growth (seasonally adjusted annual rate) in the second quarter of 2022 was 0.0 percent on June 16, 2022, unchanged from June 15 after rounding. After this morning's (June 16) housing starts report from the US Census Bureau, the nowcast of second-quarter real residential investment growth increased from -8.5 percent to -7.7 percent.



# Economic outlook summary

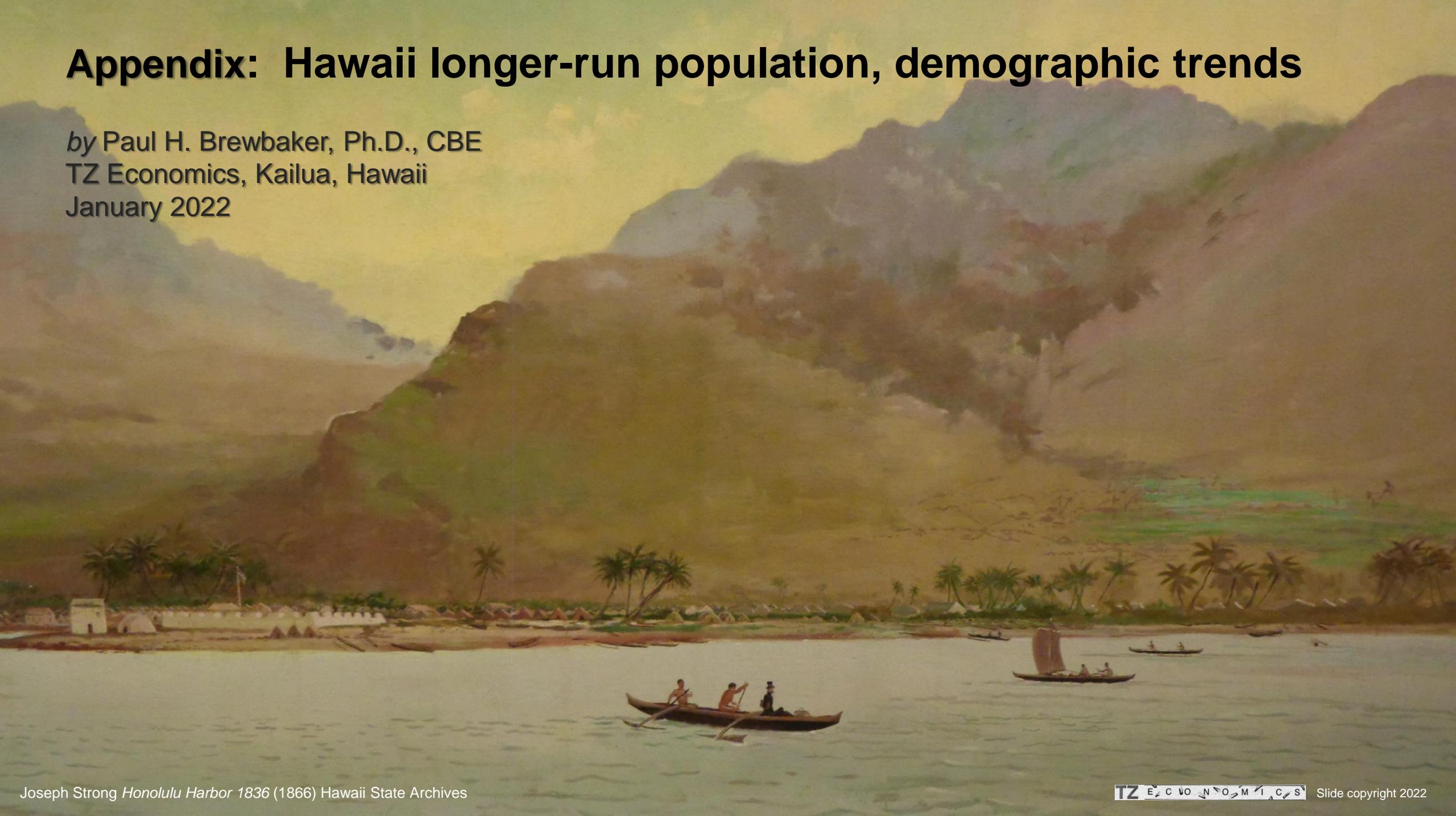
- Output and employment will stall, near-term, if not recede: 70 percent probability no recession
- Soft Landing means reset to 2 percent inflation in the next 18 months (following the inflation surge over the last 14 months—yes that’s all it’s been)
- The constraint on Hawaii economic growth is lodging capacity, unchanged since the mid-1980s save for “undocumented vacation rentals” facing prohibition
- Hawaii’s got way bigger problems:
  - Hawaii residents voting with their feet: Oahu net outmigration since mid-2010s
  - Deindustrialization: dismantling telescopes; biotech cancelled (Crispr-Cas9 Nobel Prize?); HTA destination management objective (July 2021) “decrease total visitors to Oahu;” VRs
  - You only think you have entitlement to build, you just have another lawsuit
  - TheTrain will not reach Ala Moana, which is being challenged by e-commerce
  - The Board of Water Supply can’t drill a well, much less desalinate *the Pacific Ocean*

# *Pau*

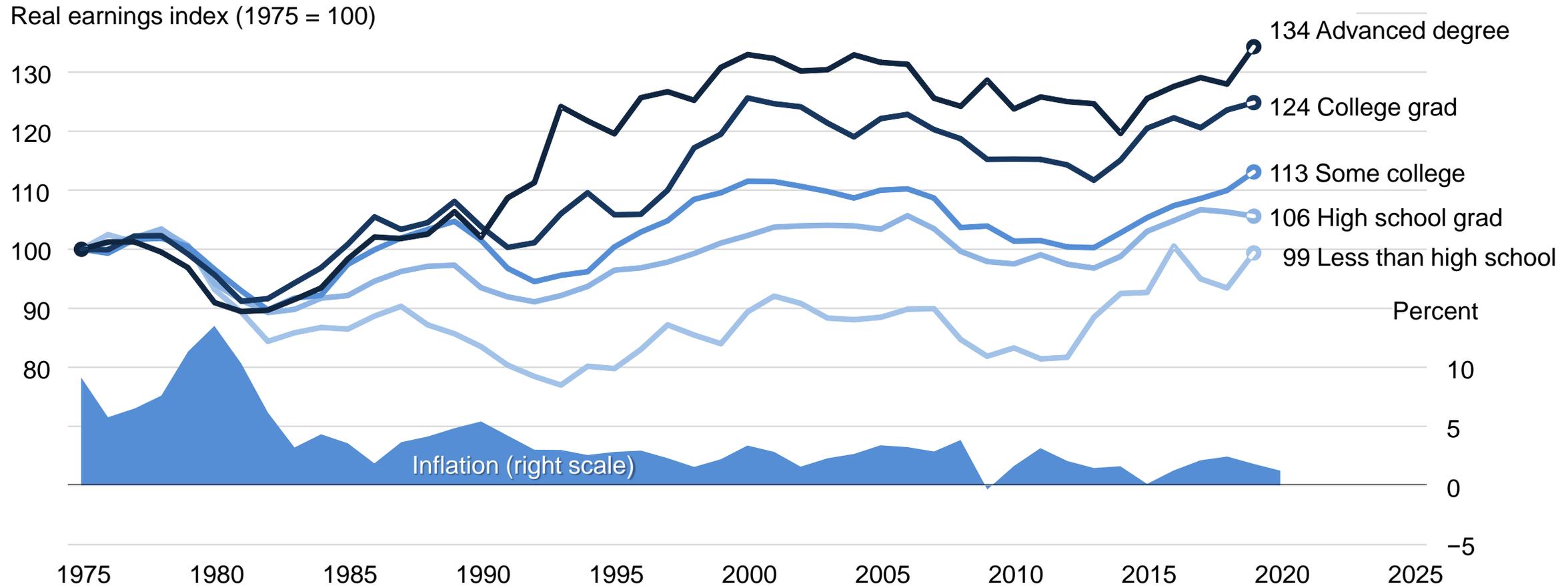


# Appendix: Hawaii longer-run population, demographic trends

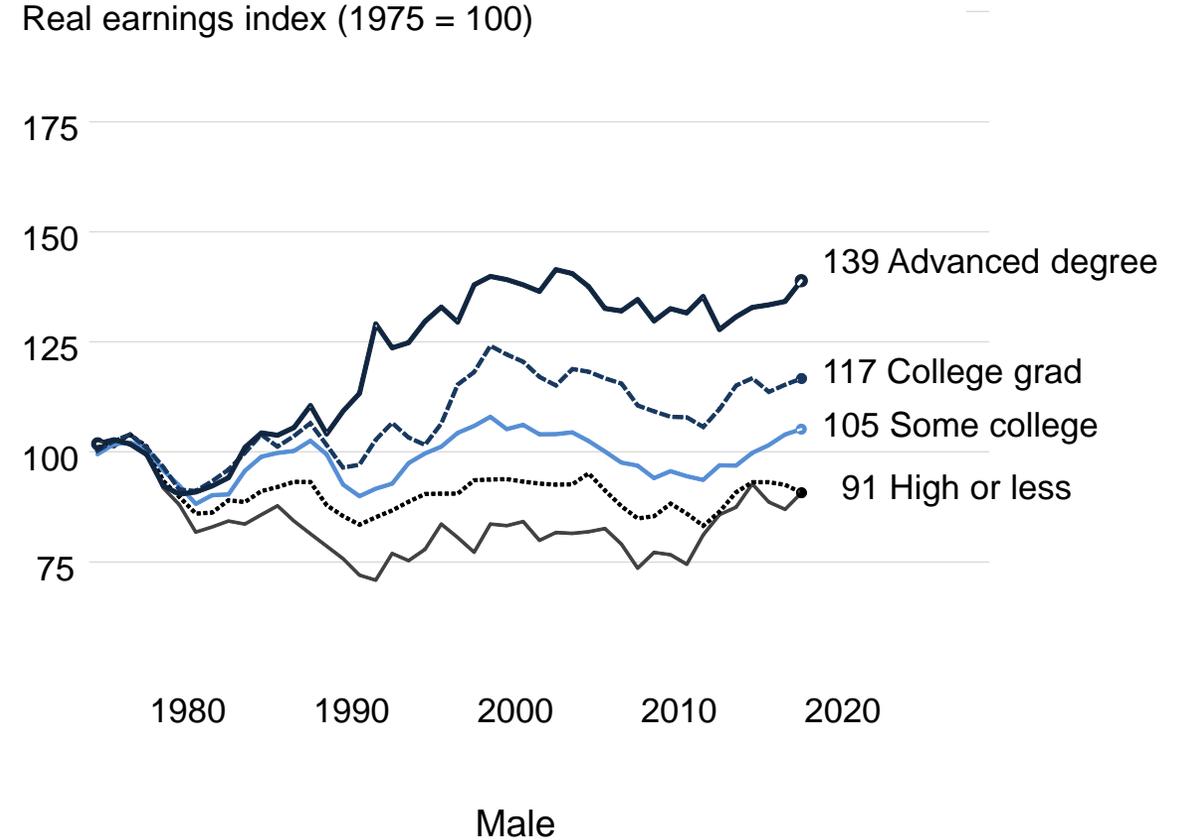
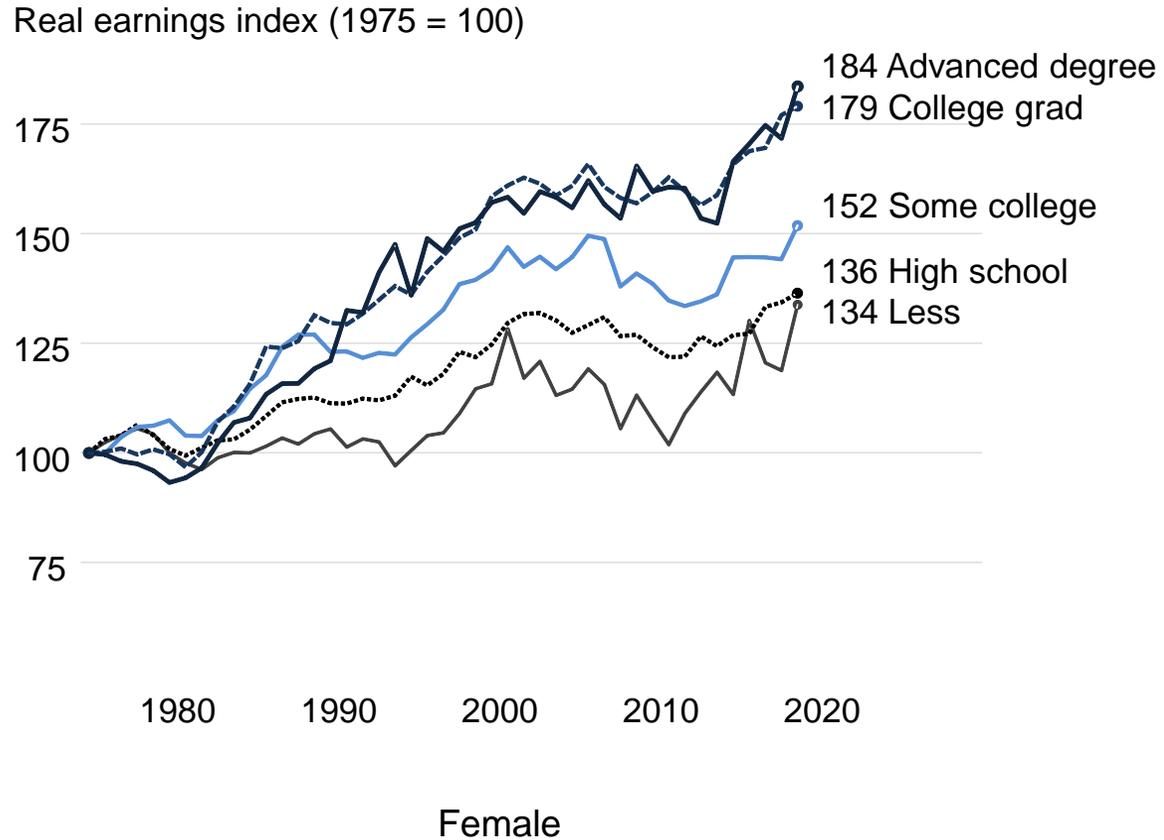
by Paul H. Brewbaker, Ph.D., CBE  
TZ Economics, Kailua, Hawaii  
January 2022



# Pre-pandemic real earnings by educational attainment favored skills-task complementarity despite lower productivity growth after 2005

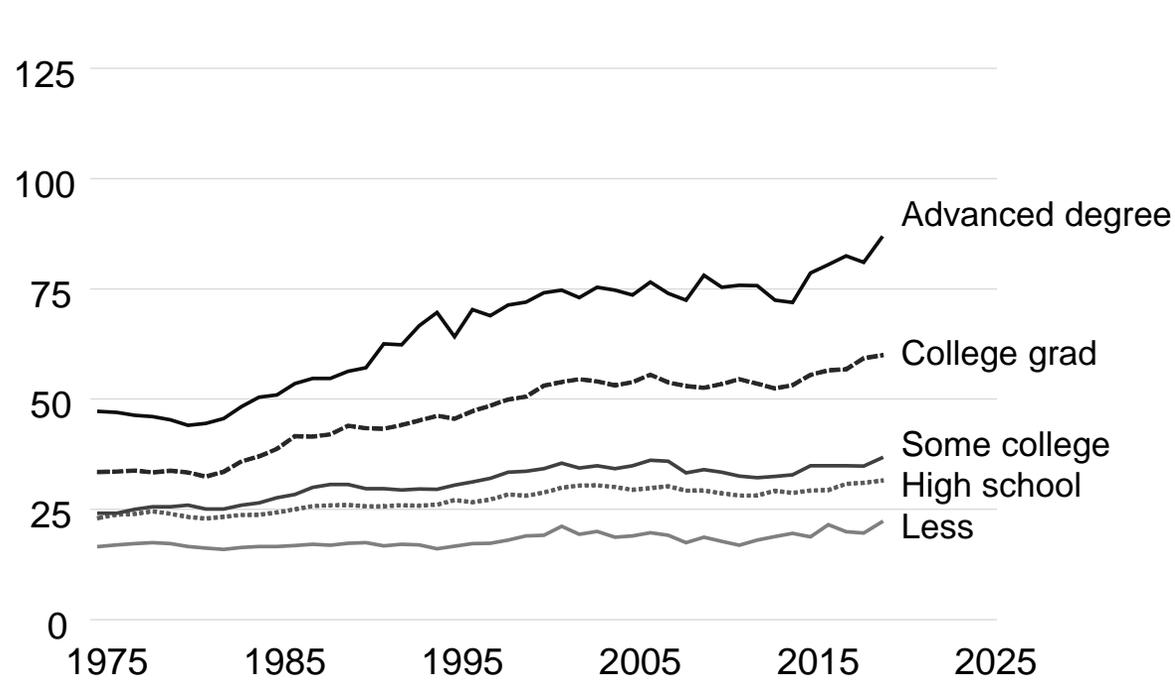


# Pre-pandemic real earnings growth by educational attainment favored women since 70s, enhanced by experience from rising participation



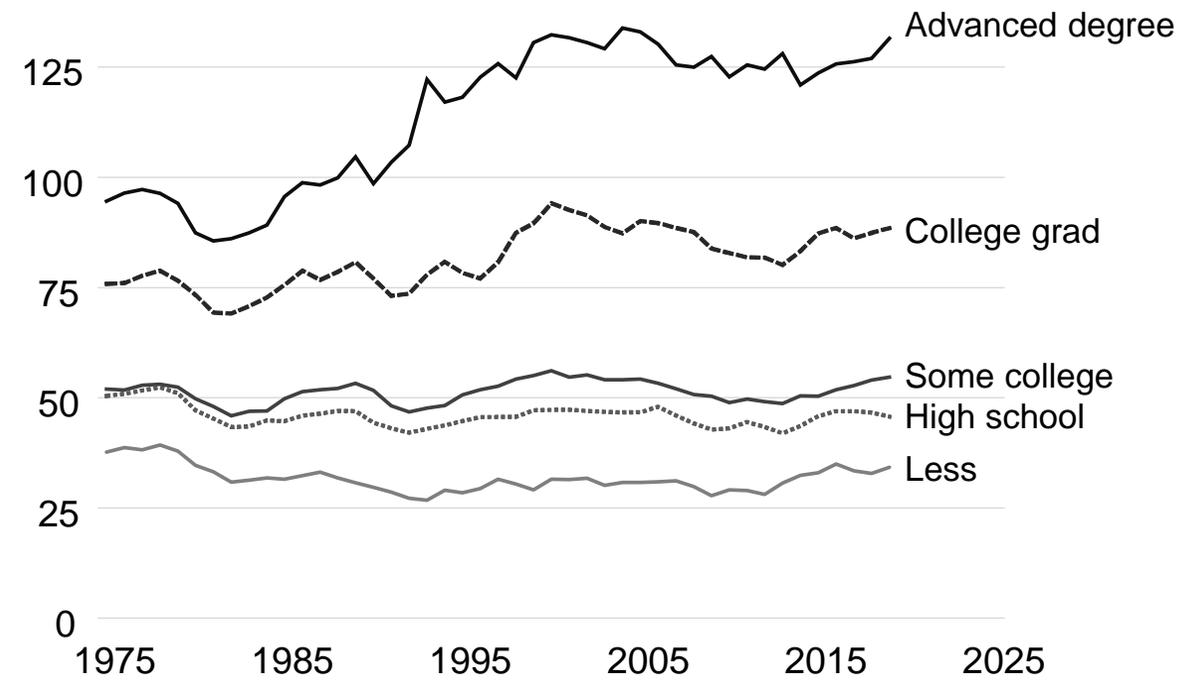
# Mean real earnings at all educational attainment levels higher for men than women, virtually unchanged over decades for less well-educated

Real earnings in thousand constant, 2020 dollars



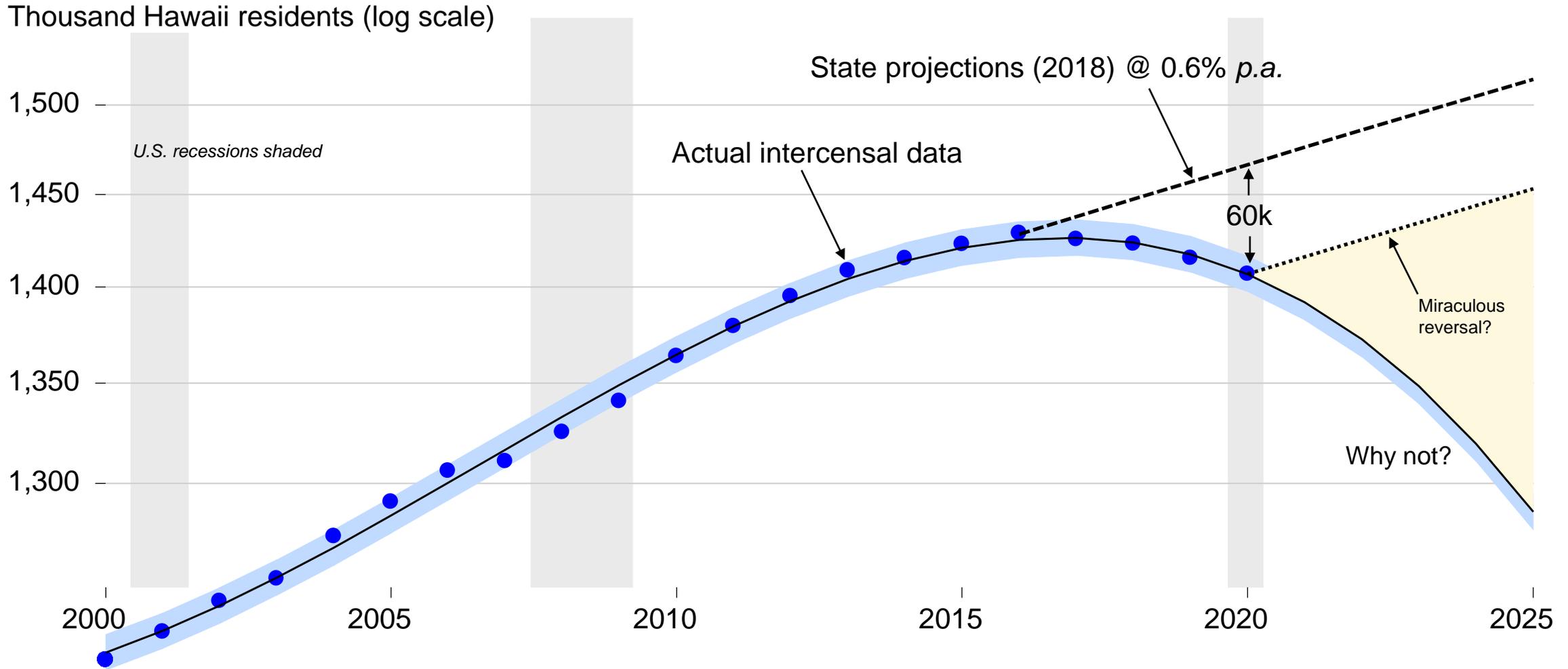
Female

Real earnings in thousand constant, 2020 dollars



Male

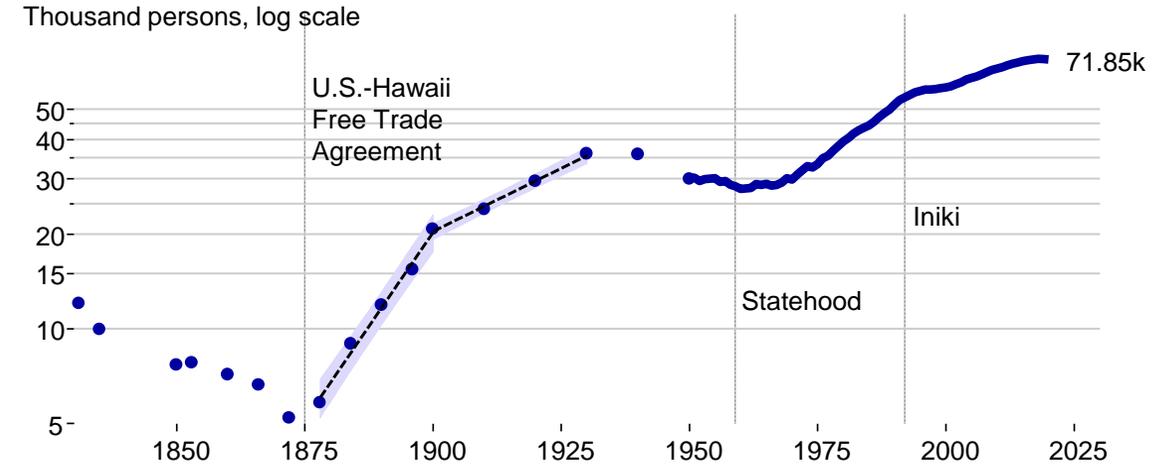
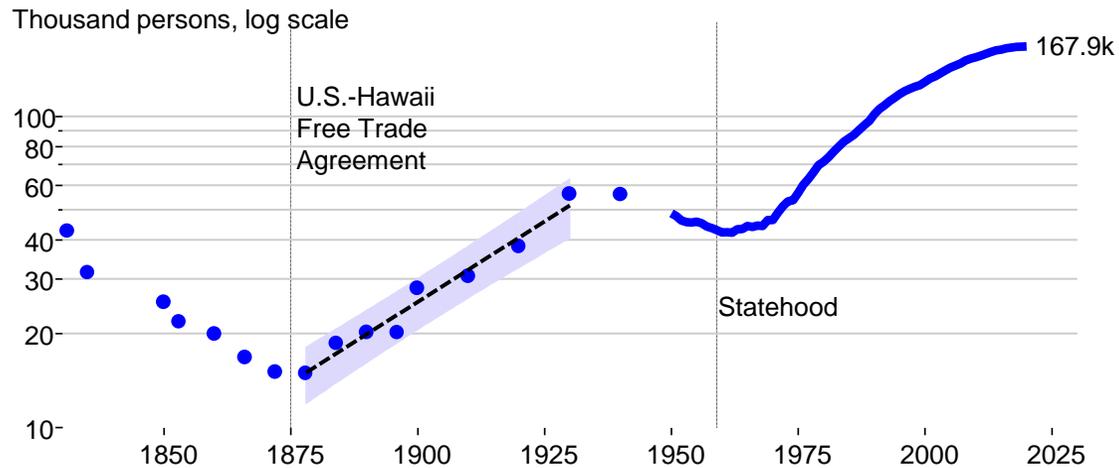
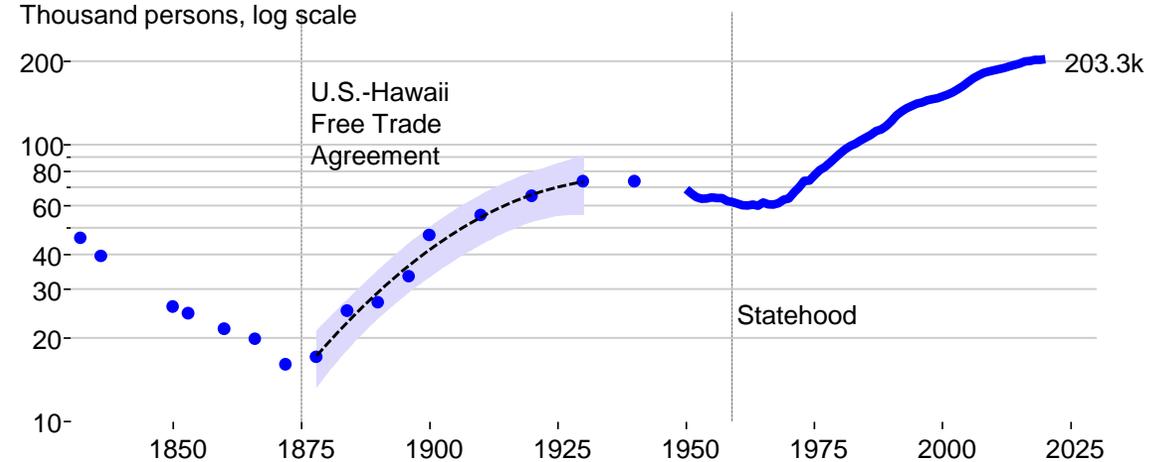
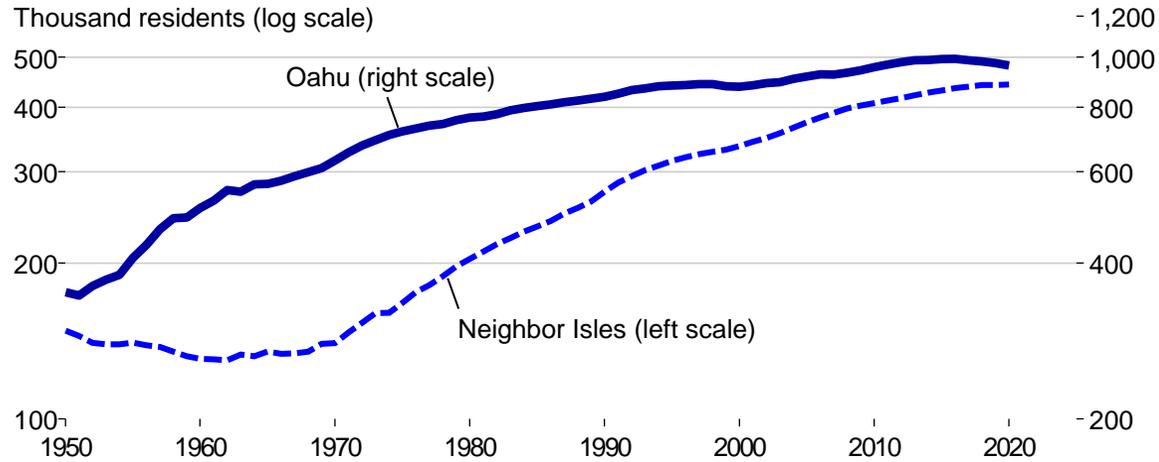
# Hawaii statewide population estimates including 2020 and official State projection (2018): more people leaving than arriving = fewer people



# Population losers and gainers 2019→2020: no clear pattern (e.g. coal, petroleum states in mid-2010s), but Hawaii lost population *pre-Covid*

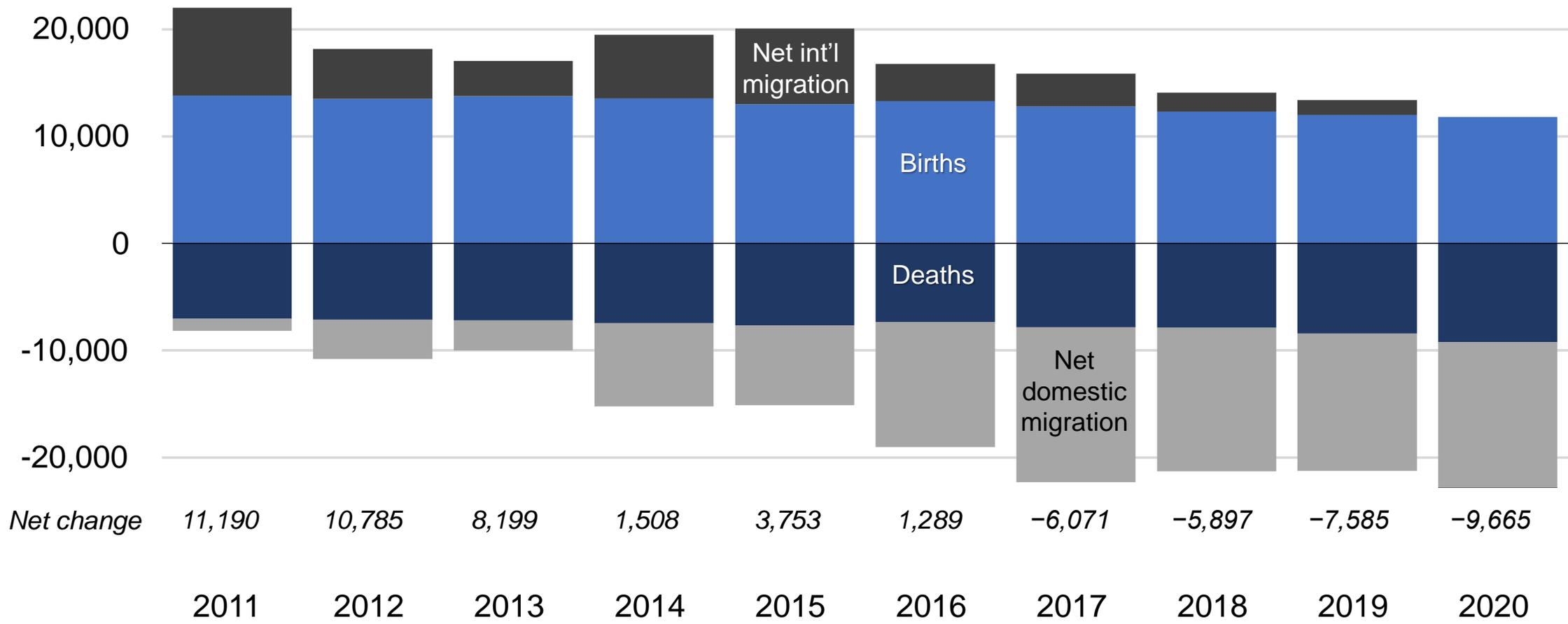
Population losers			Population gainers		
% changes		Persons	% changes		Persons
-0.6492	New York	-126,355	0.9469	North Carolina	99,439
-0.6275	Illinois	-79,487	0.9769	Montana	10,454
<b>-0.6081</b>	<b>Hawaii</b>	<b>-8,609</b>	1.0383	Delaware	10,141
-0.5835	West Virginia	-10,476	1.0453	Washington	79,588
-0.3842	Mississippi	-11,441	1.1225	Florida	241,256
-0.3333	Alaska	-2,445	1.1699	South Carolina	60,338
-0.2784	Louisiana	-12,967	1.2901	Texas	373,965
-0.2528	Connecticut	-9,016	1.4515	Utah	46,496
-0.1827	Michigan	-18,240	1.5364	Nevada	47,488
-0.1763	California	-69,532	1.7768	Arizona	129,558
-0.1221	Pennsylvania	-15,629	2.1158	Idaho	37,853
-0.1120	Vermont	-699			
-0.1000	New Jersey	-8,887			
-0.0976	Rhode Island	-1,033			
-0.0281	Ohio	-3,290			
-0.0190	Massachusetts	-1,309			

# Pre-Covid Oahu population decline reminder of mid-20<sup>th</sup> century experience of Neighbor Islands with plantation mechanization

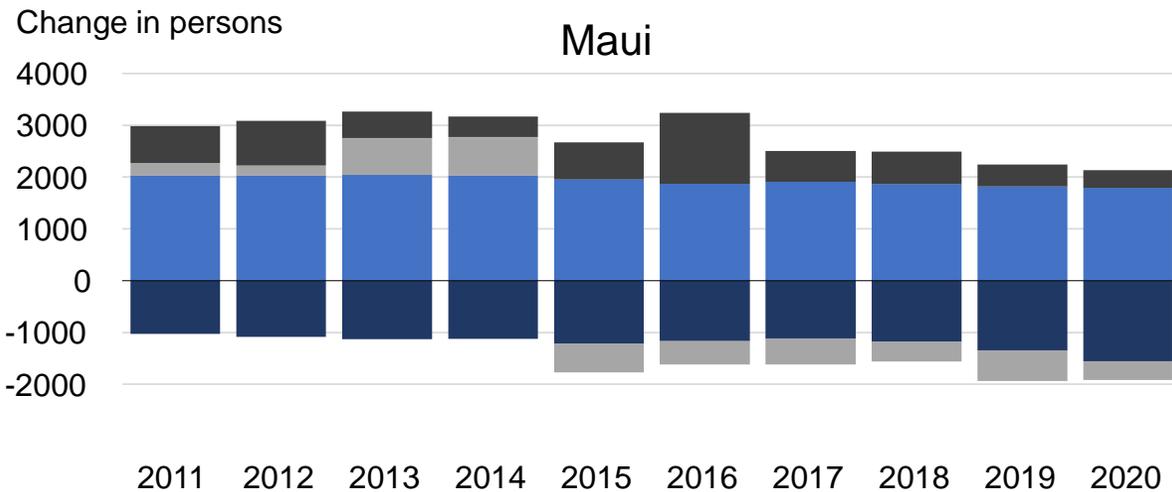
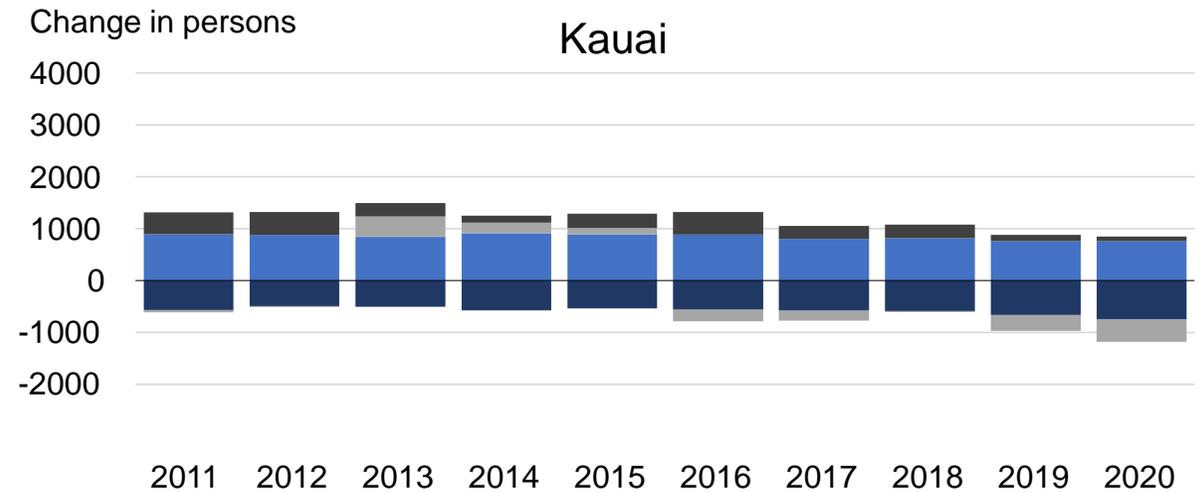
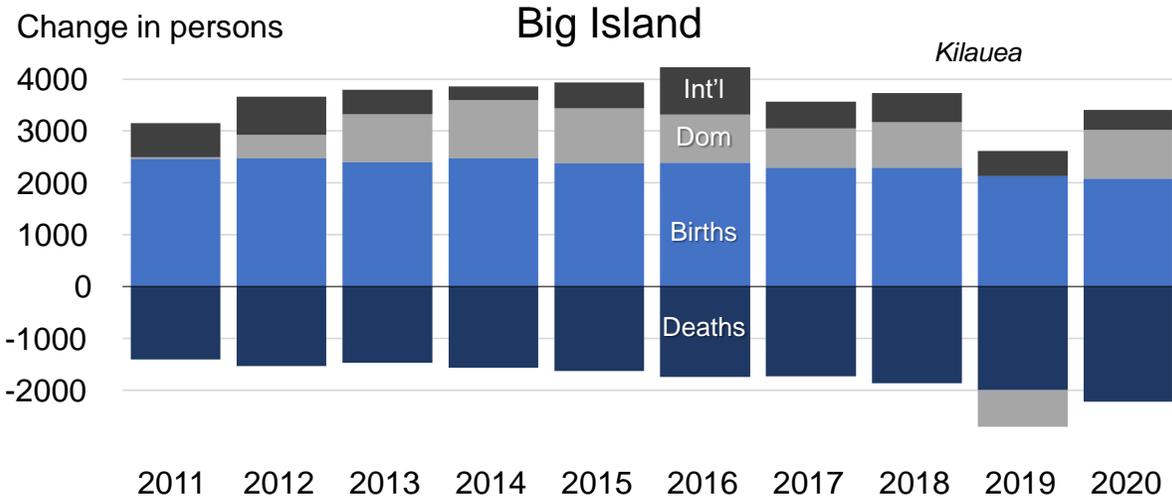


# Oahu net domestic migration has been negative for decades: more residents leaving from than moving to Oahu; “voting with their feet”

Change in Oahu resident persons per year; “voting with their feet”



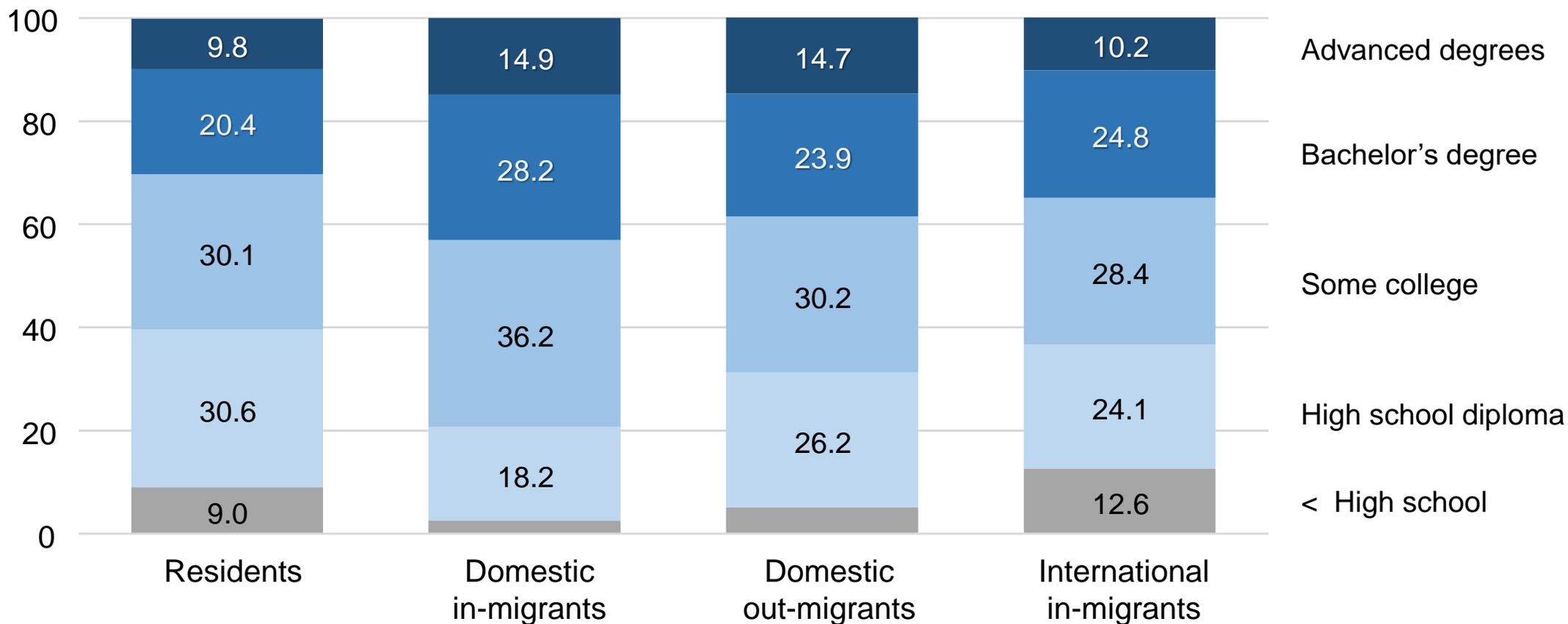
# Neighbor Island 2010s population change: more net out-migration, save on Big Island, lower fertility, aging; slow to no population growth



- Net domestic migration negative on Maui for since 2015; Kauai in 2019-2020; on Big Island after volcanic eruption
- Kauai population decline in 2019 and 2020 (-440)
- July 2010 – July 2020 cumulative percent changes:  
 9.7% Big Island (17,979 persons)  
 4.6% Kauai (4,643 persons)  
 8.3% Maui (12,877 persons)

# Educational attainment, population and migration shares: more highly educated more mobile; international immigrants more bifurcated

Percent of persons aged 18 and over and not in school



# Because all the bucks-for-lolo stay in Hawaii (right?): look at the data; Q. Does this look like Brain Drain or Brain Gain? (A: Yes)

<i>percent of total</i>	Hawaii residents	Domestic in-migrants	Domestic out-migrants	International in-migrants	Among domestic out-migrants, marginal relative odds (logistic regression model)	
Aged ≥18 and not in school	100.0	100.0	100.0	100.0	<i>relative to less than high school</i>	
< High school diploma	9.0	2.5	5.1	12.6		
High school diploma	30.6	18.2	26.2	24.1	High school diploma	1.27
Some college	30.1	36.2	30.2	28.4	Some college	1.17
Bachelor's degree	20.4	28.2	23.9	24.8	Bachelor's degree	1.31
≥ Master's degree	9.8	14.9	14.7	10.2	≥ Master's degree	1.62**

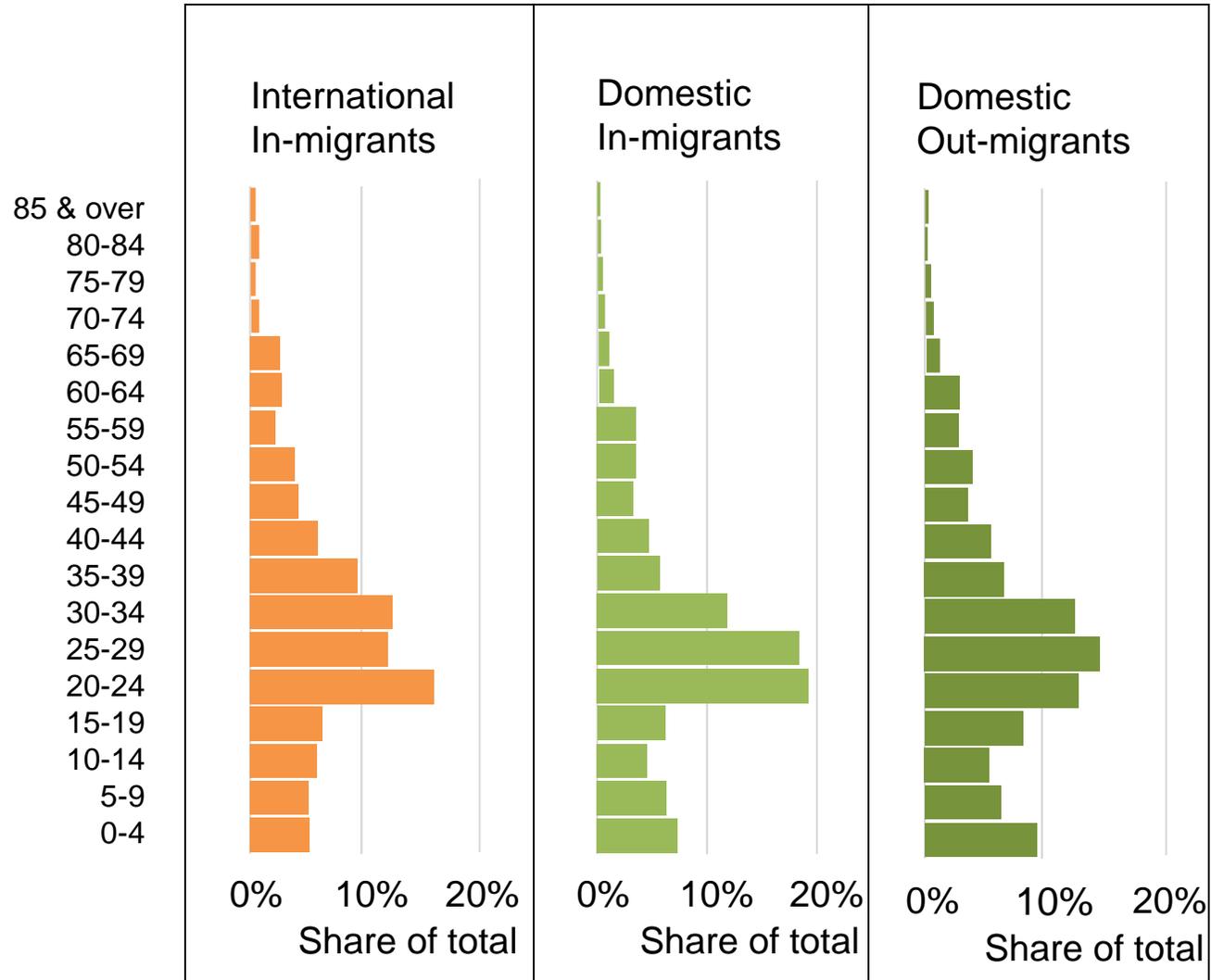
\*\*significant at the 0.01 level

Note: Hawaii 5-year totals, 2013-2017, American Community Survey, excluding military personnel and families. Domestic in-migrants numbered 36,500 and domestic out-migrants numbered 49,700, for a net loss of 13,200 persons. Including the military, in-migrants numbered 54,100, out-migrants 61,700, and the net loss was 7,600 persons.

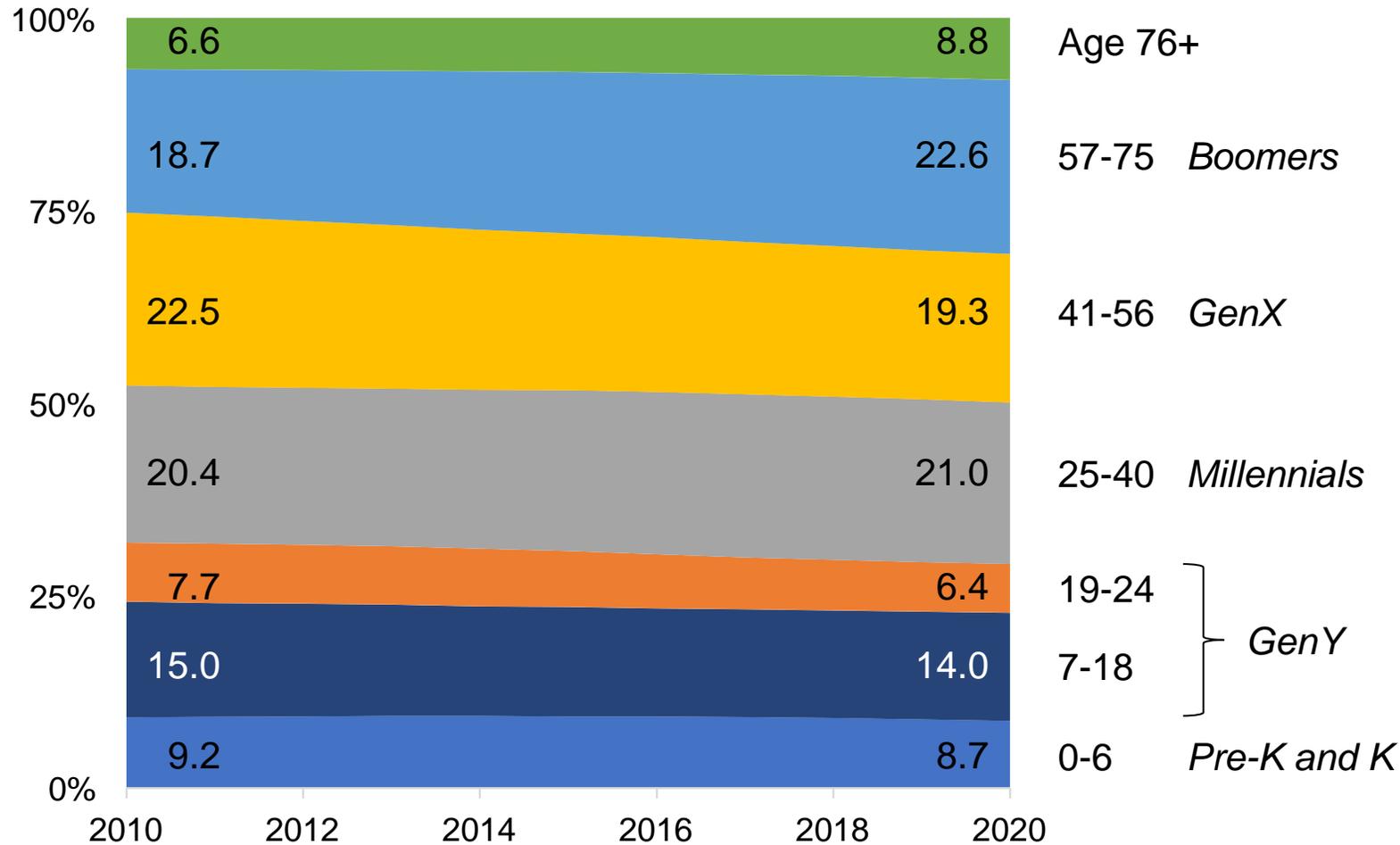
# Selected characteristics of Hawaii statewide domestic migrants, 2010 and 2019

<i>Percent shares, except totals</i>	<b>2010</b>		<b>2019</b>	
	In	Out	In	Out
<b>Marital status</b>				
Unmarried	60.9	58.5	44.1	49.2
Single, never married	48.0	40.1	33.4	39.0
Divorced or separated	10.3	16.1	7.6	7.8
Widowed	2.6	2.3	3.1	2.3
Married	39.1	41.5	55.9	42.9
<b>Educational attainment</b>				
Up to high school	20.7	26.6	17.6	24.6
Some college	37.0	37.3	30.0	39.8
Bachelor's degree	31.4	21.5	28.9	24.1
Graduate, professional degree	11.0	14.7	23.5	11.6
<b>Prior housing tenure</b>				
Homeowner	22.4	38.6	29.7	48.4
Renter	77.6	61.4	70.3	51.9
<b>ACS sample (number)</b>	53,581	49,218	49,708	68,417

# Age distribution of Hawaii migrants, 2011-15: young adults, families (Figure 2-4, DBEDT Hawaii “2045” long-range population forecasts)

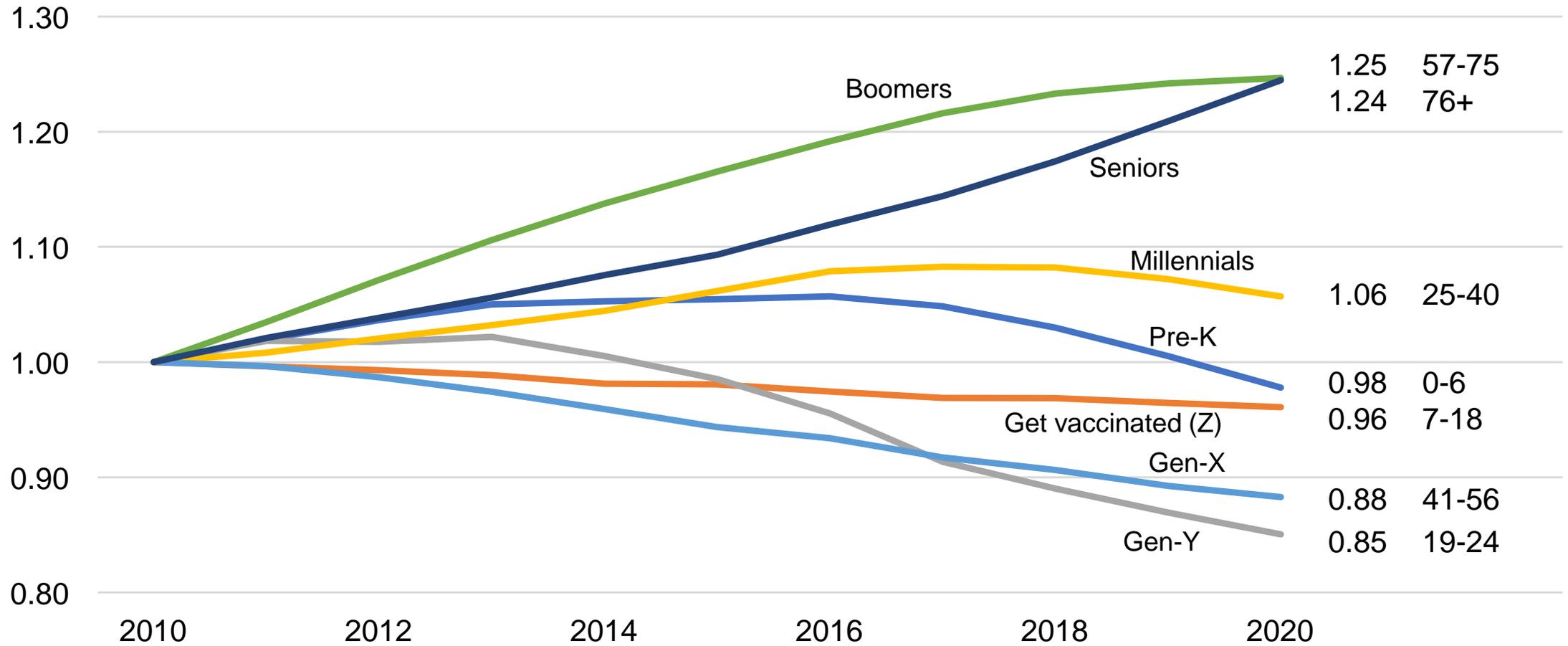


# Hawaii Millennials (1981-1996), Baby Boomers (1946-1964) greater relative importance in 2010s; rising old-age dependency to 2040s

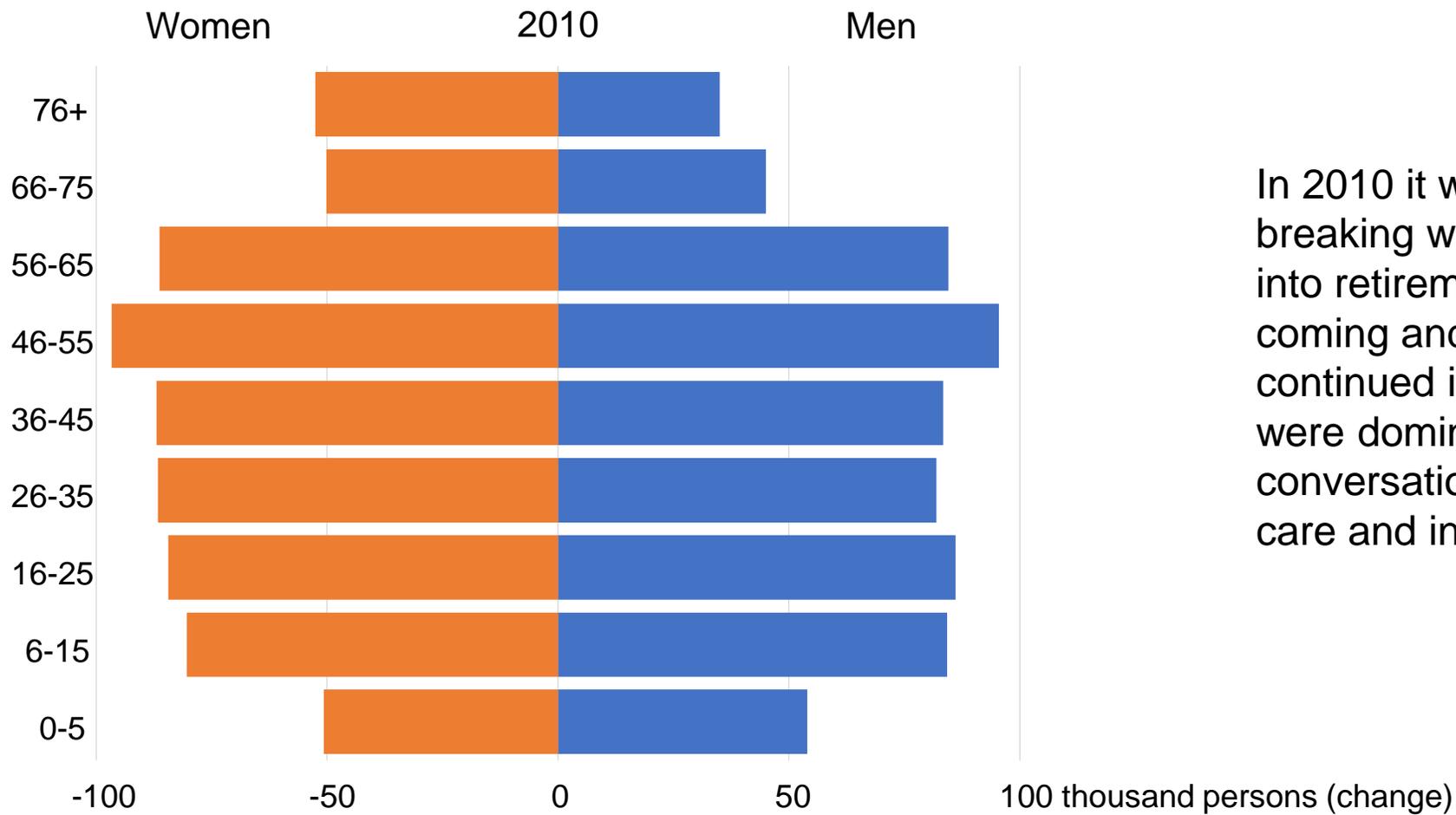


DBEDT Projections (June 2018)			
	2020	2025	2030
Civilian population shares (%)			
<b>0-17</b>	27.1	27.4	27.1
<b>18-44</b>	45.3	44.4	43.3
<b>45-64</b>	30.4	28.7	27.9
<b>65-84</b>	20.6	23.1	24.1
<b>85+</b>	3.6	3.8	4.6
	100.0	100.0	100.0
Military (as percent of total pop)			
	8.5	8.2	8.0

# Cumulative population age cohort changes during the 2010s: aging still significant, transition from 25-40s to 41-56ers forthcoming

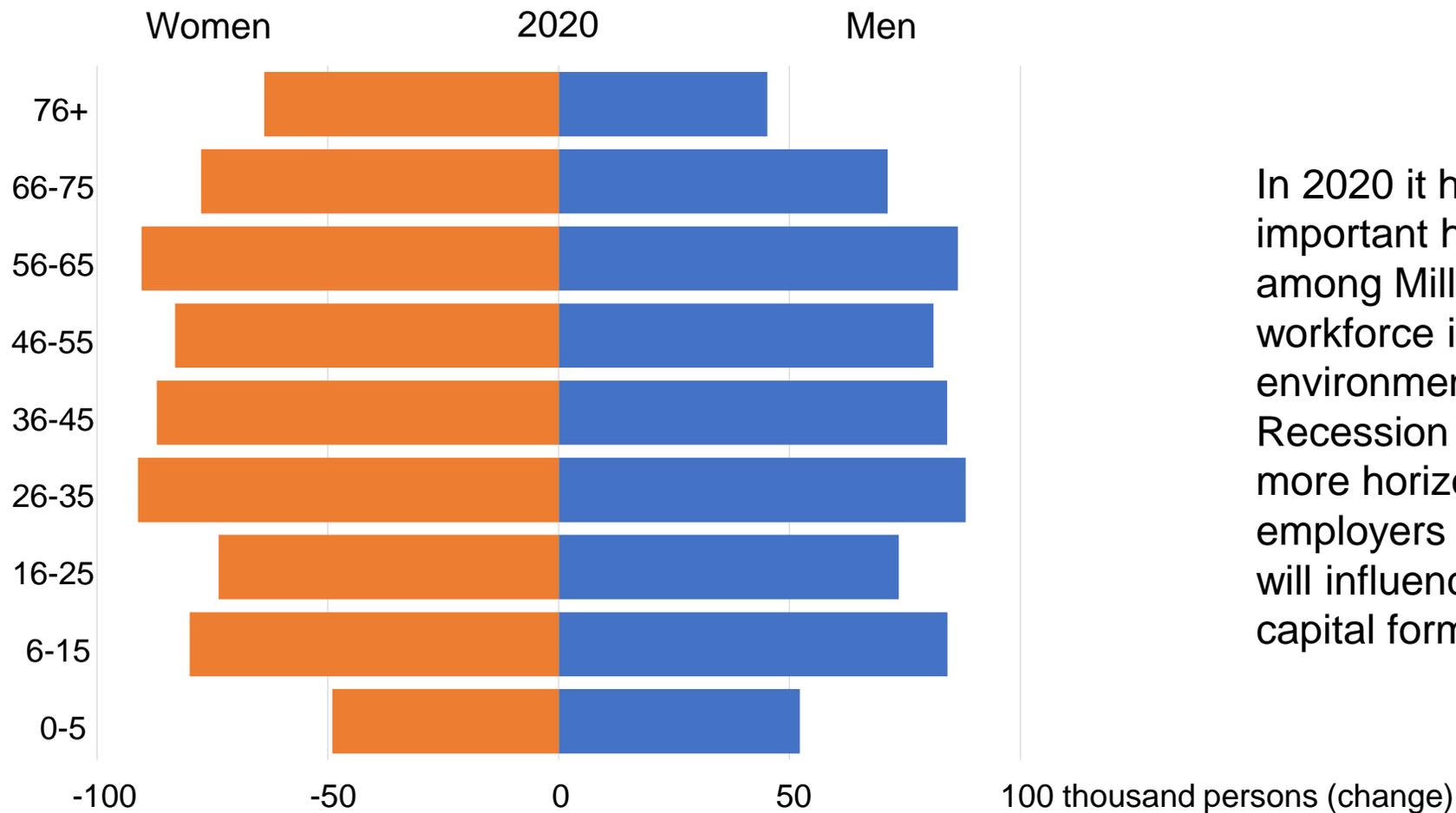


# Distribution of Hawaii population by mostly 10-year age cohorts in 2010: Baby Boomers prominent in late middle-aged cohorts



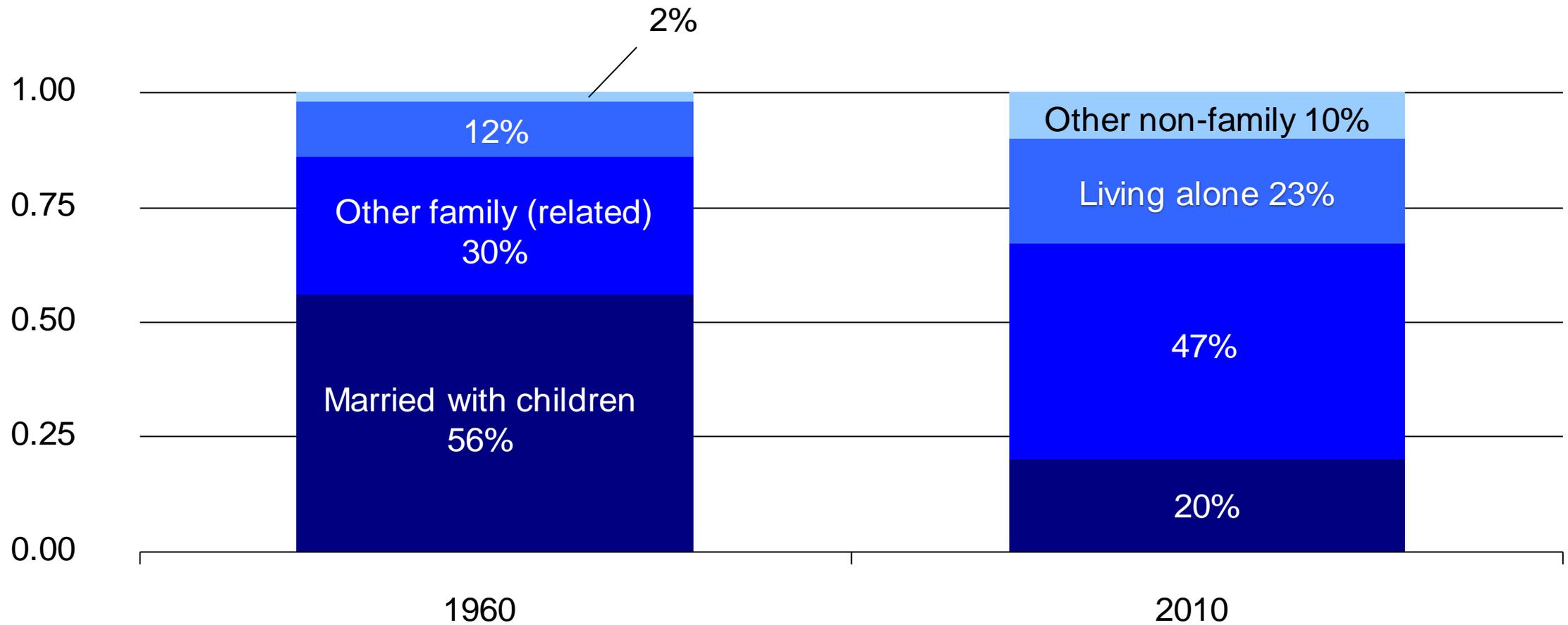
In 2010 it was obvious that the breaking wave of Boomer migration into retirement-age cohorts was coming and, when combined with continued increases in longevity, were dominating the public conversation focused on health care and insurance policies.

# Distribution of Hawaii population by mostly 10-year age cohorts in 2020: Millennials making a showing in first-time homebuying ages

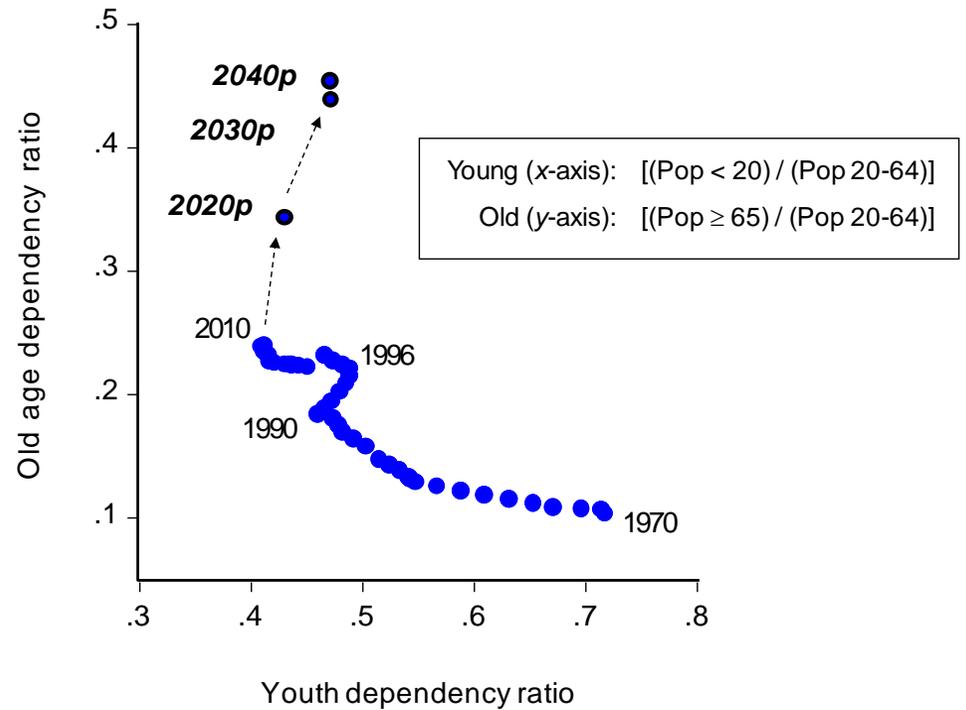


In 2020 it has become clearer how important household formation among Millennials, who entered the workforce in an uncertain environment following the Great Recession and experienced much more horizontal mobility across employers than prior generations, will influence homebuilding and capital formation during the 2020s.

# Oahu household composition shifted towards independent living



**Older population, smaller households, fewer family-with-children households, more independent living: 2020-50 reversal of mid-20<sup>th</sup> century “youthing” and late-20<sup>th</sup> century stabilization of average household size**

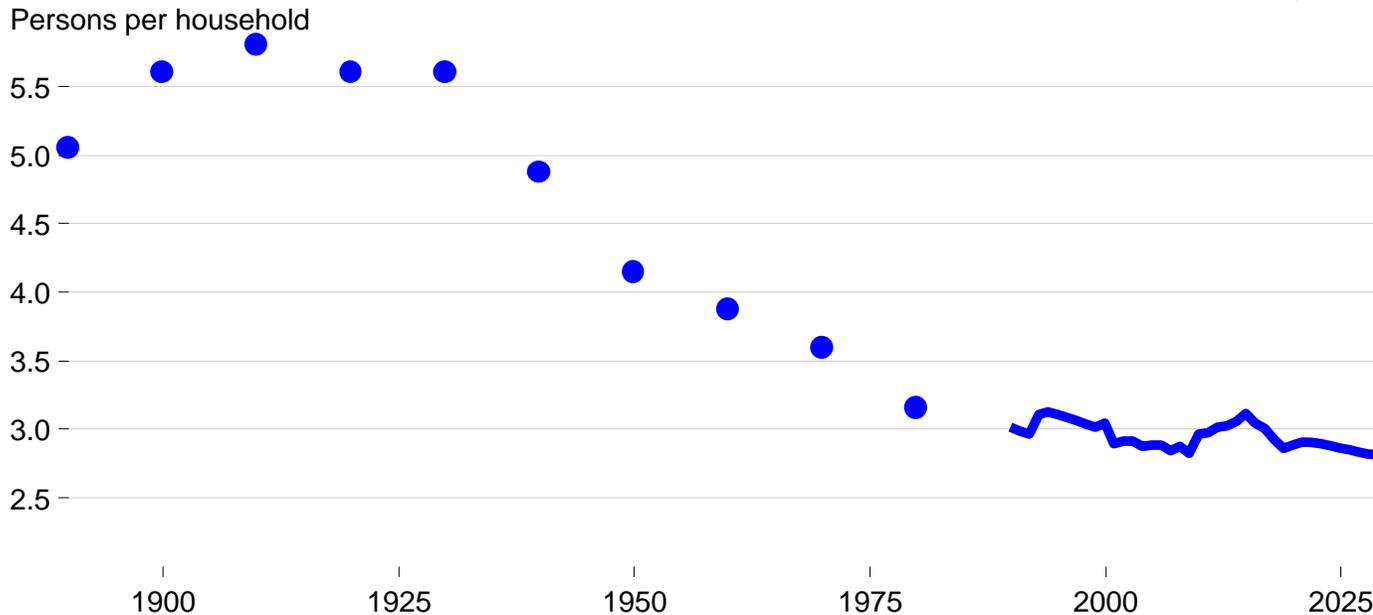


Proportions of populations under 20 and 65 and older, divided by population 20-64

Old-age dependency expected to continue to rise while youth dependency remains relatively constant through mid-century

Ultra-long demographic dynamics of old-age dependency: flip the ratio, Hawaii “workers/old peeps”

- 30+ (1920)
- 11 (1960)
- 4 (2010)
- 2 (2030)



Sources: Hawaii DBEDT State of Hawaii projections from table 1.28, *State of Hawaii Data Book* (<http://hawaii.gov/dbedt/info/economic/databook/db2011/section01.xls> (historical data, TZE database), and *Kaka'ako: Urban Core Living* (June 2014) (<http://files.hawaii.gov/dbedt/economic/reports/2014-06-kakaako-study.pdf>)

# *Pau*



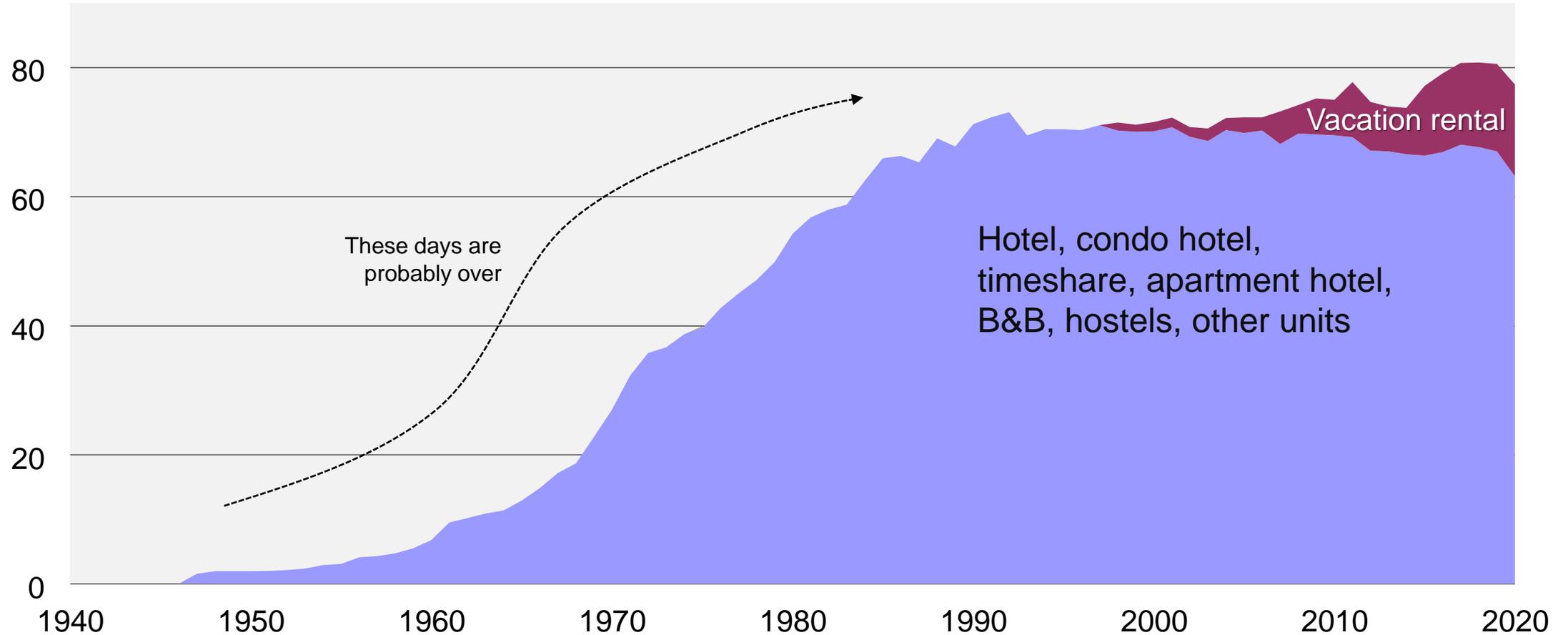


# Appendix: new resorts or renovations?

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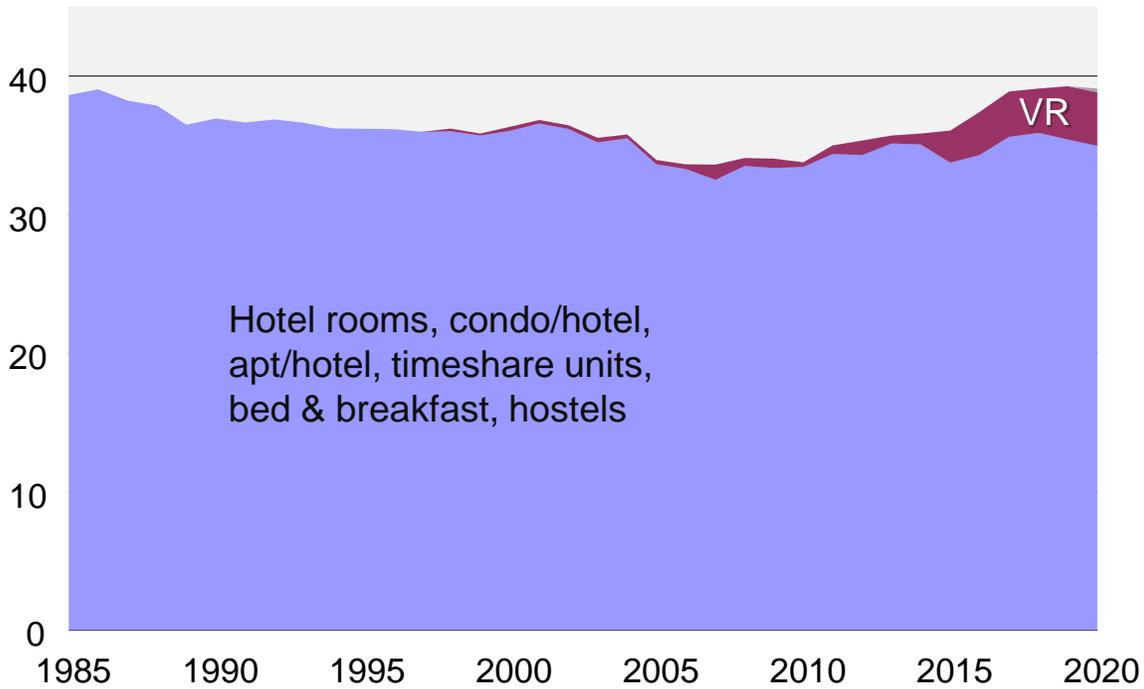
# Entire *net* increase in Hawaii's visitor plant inventory for last 25 years comprised vacation rentals—political decision: constrain capacity

Thousand Hawaii statewide lodging units



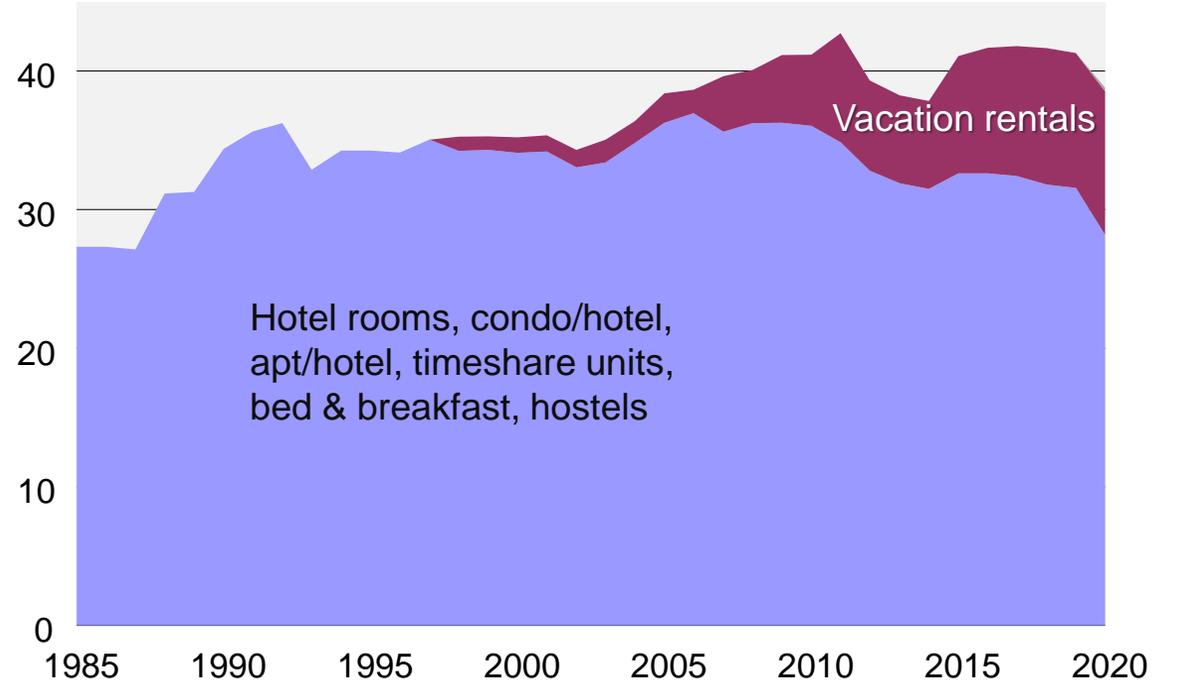
# Hosting apps reduce search/matching cost (demand), entry barriers are binding (supply); Hawaii mostly renovates, replaces *existing* inventory

Thousand Oahu lodging units



Oahu

Thousand Neighbor Island lodging units



Neighbor Islands combined

*Pau*